NORTH CAROLINA DIVISION OF AIR QUALITY

Application Review

Issue Date: DRAFT

Region: Fayetteville Regional Office
County: Cumberland
NC Facility ID: 2600102
Inspector's Name: Joshua L. Harris
Date of Last Inspection: 11/18/2015
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): HQ XVIII ABN Corps & Fort Bragg

Facility Address:
HQ XVIII ABN Corps & Fort Bragg
Bldg 3-1137
Fort Bragg, NC 28310

SIC: 9711 / National Security
NAICS: 92811 / National Security

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP: N/A
NSPS: N/A
NESHAP: 40 CFR Part 63, Subpart DDDDD
PSD: N/A
PSD Avoidance: N/A
NC Toxics: N/A
112(r): N/A
Other: N/A

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Gary Cullen Air Program Manager (910) 432-8464 IMBG-PWE-C Fort Bragg, NC 28310+5000	Monica Stephenson Director, Directorate of Public Works (910) 396-4009 IMBG-PW Fort Bragg, NC 28310+5000	Gary Cullen Air Program Manager (910) 432-8464 IMBG-PWE-C Fort Bragg, NC 28310+5000

Application Data

Application Number: 2600102.15B
Date Received: 12/22/2015
Application Type: Renewal
Application Schedule: TV-Renewal

Existing Permit Data
Existing Permit Number: 04379/T42
Existing Permit Issue Date: 06/15/2016
Existing Permit Expiration Date: 09/30/2016

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2015	1.28	86.25	40.00	55.52	7.14	5.09	1.86 [Toluene]
2014	1.34	93.50	44.35	61.32	6.78	5.02	1.87 [Toluene]
2013	1.41	85.86	44.56	58.00	6.57	5.82	2.02 [Toluene]
2012	1.66	59.46	42.77	35.54	5.87	4.64	2.02 [Toluene]
2011	2.07	70.14	45.28	47.36	5.78	4.82	2.11 [Toluene]

Review Engineer: Kevin Godwin

Review Engineer's Signature: **Date:**

Comments / Recommendations:
Issue: 04379/T43
Permit Issue Date: DRAFT
Permit Expiration Date: DRAFT

I. Introduction

A. According to the renewal application, Fort Bragg Army Post (Fort Bragg) is home to both the 82nd Airborne Division and the XVIII Airborne Corps Headquarters. The existing permit covers sources consisting of boilers, generators, paint booths, engine test stands, and a cogeneration turbine. Additionally, there are a number of insignificant activities, including parts washers, abrasive blasting, emergency generators, incinerators, hot water heaters, liquid storage tanks, and woodworking operations.

B. The application to renew the existing Title V air quality permit was received by the Division of Air Quality (DAQ) on December 22, 2015 or within nine months prior to permit expiration, and is currently covered by the application shield provided in 15A NCAC 02Q .0512.

C. The Permittee has not proposed any changes to the existing Title V operating permit as part of the renewal process. The renewed permit will include the permit revisions associated with the following applications:

Technical reviews for each of the above applications are included as attachments to this document.

- Attachment A: Significant modification under 15A NCAC 02Q .0501(d)(1) for application 2600102.15A
- Attachment B: Significant modification under 15A NCAC 02Q .0501(d)(1) for application 2600102.14B
- Attachment C: Minor modification under 15A NCAC 02Q .0515 for application 2600102.14A
- Attachment D: Significant modification under 15A NCAC 02Q .0501(c)(2) for application 2600102.13A
- Attachment E: Significant modification under 15A NCAC 02Q .0501(c)(1) for application 2600102.12B
- Attachment F: Significant modification under 15A NCAC 02Q .0501(c)(1) for application 2600102.12A and .12C
- Attachment G: Significant modification under 15A NCAC 02Q .0501(c)(2) for application 2600102.11B

II. Changes to Existing Title V Air Permit

The following table provides a summary of changes made with this permit revision 04379T43.

Page No.	Section	Description of Change
Cover letter	N/A	Amended application type; permit revision numbers, dates and included updated letterhead.
1	Permit cover page	Amended permit revision numbers and all dates.
N/A	All, Header	Updated permit revision number.
old page Nos.47 and 49	2.1 N. and O.	Removed applicability of 15A NCAC 02D .0958.
old page No. 56	2.2	Removed specific condition pertaining to 15A NCAC 02D .0958.
83	2.2 L.2	Included MACT DDDDD language for existing boilers.
88	2.2 L.3	Included MACT DDDDD language for existing boiler ES-34B.
Global	Global	Replaced the word assure with ensure throughout permit, except General Conditions.

III. Statement of Compliance

DAQ has reviewed the facility's compliance status. The facility was last inspected in November 2015 by Mr. Joshua Harris of the Fayetteville Regional Office (FRO). According to the inspection report, the facility appeared to be operating in full compliance with all applicable requirements. Regarding the 5-year compliance history, the report notes that a Notice of Deficiency (NOD) was issued on August 25, 2015 for a late NESHAP Subpart ZZZZ notification.

IV. Review of Applicable Regulations

A. Natural gas/No. 2 Fuel Oil-Fired Boilers

1. Applicable Regulatory Requirements
   a. 15A NCAC 02D .0503,
   b. 15A NCAC 02D .0516,
   c. 15A NCAC 02D .0521(d) and (c),
   d. 15A NCAC 02D .0524, 40 CFR Part 60, Subpart Dc
   e. 15A NCAC 02D .1109 [112(j) Case-by-Case MACT] applicable until May 19, 2019
   f. 15A NCAC 02Q .1111 MACT, 40 CFR Part 63, Subpart DDDDD, applicable beginning May 20, 2019, the boilers are considered existing sources.
   g. 15A NCAC 02Q .0317, for avoidance of 02D .0530 "Prevention of Significant Deterioration"

2. The only new regulation that applies to the existing boilers is 15A NCAC 02D .1111, 40 CFR Part 63, Subpart DDDDD. A new condition referencing the requirements under Subpart DDDDD will be placed in the renewed permit. The existing permit includes a condition referencing the requirements under Subpart DDDDD for the new boilers (constructed after June 4, 2010). No other regulatory review is required at this time.

B. Diesel fuel-fired Engines

1. Applicable Regulatory Requirements
   a. 15A NCAC 02D .0516,
   b. 15A NCAC 02D .0521,
   c. 15A NCAC 02D .0524, 40 CFR Part 60, Subpart IIII,
   d. 15A NCAC 02D .1111, 40 CFR Part 63, Subpart ZZZZ, and
   e. 15A NCAC 02Q .0317, for avoidance of 02D .0530 "Prevention of Significant Deterioration"

2. No new applicable regulations apply to these sources as part of the Title V permit renewal. No other regulatory review is required at this time.

C. Three dry filter-type paint spray booths (ES-01C, ES-02C, and ES-08C), one dry filter-type paint spray booth (ES-09C) using non-reactive water reducible Chemical Agent Resistant Coatings only along with natural gas-fired bake ovens

1. Applicable Regulatory Requirements
   a. 15A NCAC 02D .0515
   b. 15A NCAC 02D .0521
   c. 15A NCAC 02D .1100/15A NCAC 02Q .0711

2. No new applicable regulations apply to these sources as part of the Title V permit renewal. No other regulatory review is required at this time.

D. One dry filter-type paint spray booth (ID No. ES-10C, MACT Subpart GG), using epoxy primer and Chemical Agent Resistant Coating (CARC), with one natural gas-fired make up air heater (3.3 million Btu per hour maximum heat input, ID No. ES-10H), controlled by one natural gas-fired thermal oxidizer (1.2 million Btu per hour maximum heat input, ID No. CD-10C), Building P-3354

One dry filter-type paint spray booth (ID No. ES-12C, MACT Subpart GG) with HVLP application located at Simmons Army Air Field

1. Applicable Regulatory Requirements
   a. 15A NCAC 02D .0515
   b. 15A NCAC 02D .0521
   c. 15A NCAC 02D .1111, 40 CFR Part 63, Subpart GG

2. No new applicable regulations apply to these sources as part of the Title V permit renewal. No other regulatory review is required at this time.

E. Two diesel vehicle engine test stands (ES-01E and ES-02E) located at the Material Maintenance Division

1. Applicable Regulatory Requirements
   a. 15A NCAC 02D .0516

2. No new applicable regulations apply to these sources as part of the Title V permit renewal. No other regulatory review is required at this time.

F. One paper pulverizer (maximum 2000 lbs per hour input, ES-01P) with associated bagfilter (612 square feet of surface area)
1. Applicable Regulatory Requirements
   a. 15A NCAC 02D .0515
   b. 15A NCAC 02D .0521

2. No new applicable regulations apply to these sources as part of the Title V permit renewal. No other regulatory review is required at this time.

G. Plasma Arc Cutter (ES-01PC) with a cartridge filter dust collector (CD-01PC) located in Building O-190-R61

1. Applicable Regulatory Requirements
   a. 15A NCAC 02D .0515
   b. 15A NCAC 02D .0521

2. No new applicable regulations apply to these sources as part of the Title V permit renewal. No other regulatory review is required at this time.

H. Tank Cleaning and Purging System with direct propane-fired contact water heater (5.0 mmBtu per hour heat input, ES-01TP)

1. Applicable Regulatory Requirements
   a. 15A NCAC 02D .0516
   b. 15A NCAC 02D .0521

2. No new applicable regulations apply to these sources as part of the Title V permit renewal. No other regulatory review is required at this time.

V. Compliance Assurance Monitoring (CAM)

Pursuant to 40 CFR 64.2, the provisions of the CAM rule are applicable to emission units that meet all of the following criteria:

1. The unit is subject to an emissions limitation AND uses a control device to achieve compliance with the limit;
2. The unit has pre-control potential emissions that are equal to or greater than 100% of the amount (in tpy) required for a source to be classified as a major source; and
3. The unit is not exempt under 40 CFR 64.2(b).

According to the renewal application, CAM was addressed in the previous renewal application dated August 27, 2010. It was determined that the CAM Rule control device definition does not apply to any of the three emission sources (ID Nos. ES-01PC, ES-01P, and ES-10C) equipped with control equipment. There have been no new sources added since the last Title V renewal application that need to be evaluated for CAM.

VI. Maximum Achievable Control Technology (MACT) Applicability

Ft. Bragg is a major source of hazardous air pollutants (HAP). The facility has emergency generators subject to 40 CFR Part 63, Subpart ZZZZ – RICE MACT. The current permit includes a condition detailing the requirements under Subpart ZZZZ.

The facility has boilers subject to 40 CFR Part 63, Subpart DDDDD. The existing permit includes a condition for 15A NCAC 02D .1109 (112(j) Case-by-Case MACT) for existing boilers (commenced construction before June 4, 2010) which is valid through May 19, 2019. A new condition referencing the requirements under 40 CFR Part 63, Subpart DDDDD valid beginning May 20, 2019 is placed in the renewed permit. For the new boilers (commenced construction after June 4, 2010), compliance with Subpart DDDDD was required upon start-up. The existing permit includes a condition referencing the Subpart DDDDD requirements for the new boilers.

Two existing dry filter-type spray booths (ID Nos. ES-10C and ES-12C) are subject to 40 CFR Part 63, Subpart GG. The existing permit includes a condition referencing the facility's requirements under Subpart GG. No changes are necessary.

VII. Prevention of Significant Deterioration (PSD)

According to the application, the Ft. Bragg facility is an existing major stationary source with a potential to emit criteria pollutants greater than 250 tons per year. The facility is currently operating under PSD avoidance conditions for several emission sources. The existing conditions are carried over to the renewed permit. No changes are necessary.

VIII. New Source Performance Standards (NSPS)

Several boilers are subject to 40 CFR Part 60, Subpart Dc. All required notifications have been sent. The existing permit includes conditions referencing the requirements under Subpart Dc. The condition is carried over to the renewed permit. No changes are necessary.

The existing natural gas/No. 2 fuel oil-fired cogeneration gas turbine (ID No. ES-33B) is subject to 40 CFR Part 60, Subpart GG. The existing permit includes a condition pertaining to Subpart GG. The condition is carried over to the renewed permit. No changes are necessary.

IX. Toxic Air Pollutant (TAP) Procedures

According to the application, the facility was required to submit a toxics air pollutant (TAP) demonstration no later than January 13, 2012. The demonstration included all permitted sources up through revision T35. Emission inputs for the modeling were based on potential-to-emit rates. Results of the modeling were reviewed by DAQ and determined to show compliance with the acceptable ambient levels (AAL) listed in 15A NCAC 02D .1104. No operating limitations were necessary. Modifications undertaken at the facility since the last modeling demonstration are not expected to result in an unacceptable health risk due to TAP emissions. Rule 15A NCAC 02Q .0702 exempts sources subject to a requirement under 40 CFR Part 63 or case-by-case MACT from being subject to a TAP evaluation as long as emissions do not pose an unacceptable risk. Therefore, no additional TAP evaluation is required.

X. Insignificant Activities

The existing permit includes a list of insignificant activities under 15A NCAC 02Q .0503(8). DAQ has confirmed that maximum emissions from these sources are less than 5 tpy of all regulated criteria pollutants and less than 1,000 lb/year HAP

XI. Permitting History Since Issuance of Title V Permit Renewal

Permit	Issue Date	Description
04379T42	June 15, 2016	1. Add three (3) natural gas-fired boilers (ID Nos. ES-908B, 909B, and 910B, 4.2, 3.2, and 2.7 million Btu per hour heat input, respectively),

Permit	Issue Date	Description
		2. Add three (3) diesel-fired emergency generators (ID No. ES-198GI 600 kilowatts and ID Nos. ES-196GI, ES-197GI, 100 kilowatts each), 3. Add eighteen (18) natural gas-fired boilers and one (1) No. 2 fuel oil-fired boiler as insignificant activities under ID No. IES-00B, 4. Add a soldering training and welding shop (ID Nos. IES-22W and IES-23W) as insignificant activities, 5. Remove eighteen (18) small boilers, ten (10) emergency generators, one (1) air stripper, and one (1) welding shop, 6. Add an existing brass deformer (ID No. ES-107BDI) to the insignificant activity list, 7. Move existing hot water heaters to the insignificant activity list under source ID No. IES-00B) as they are categorically exempt from MACT DDDDD and qualify as insignificant activities under 15A NCAC 02Q .0503(8). 8. Various administrative changes.
04379T41	July 24, 2015	1. Add five (5) diesel-fired emergency generators and fifteen (15) small natural gas-fired boilers, 2. Add insignificant activities consisting of small natural gas-fired boilers, distillate fuel oil-fired boilers, and propane-fired boilers. These units fall under the definition of "hot water heater" as defined in 40 CFR 63 Subpart DDDDD as they are less than a maximum heat input of 1.6 million Btu per hour and produce hot water, 3. Remove two (2) small emergency generators and three (3) hot water heaters. 4. Add natural gas as a primary fuel for three (3) existing 8.3 million Btu per hour distillate fuel oil-fired boilers. 5. Correct applicability for small boiler not exempt under 40 CFR 63 Subpart DDDDD as "hot water heaters." 6. Several administrative corrections On April 10, 2015, DAQ received an addendum to the application for the following additions: - four (4) natural gas-fired boilers (ID Nos. ES-904B through 907B), - one (1) diesel-fired emergency generator (ID No. ES-195GI), - four (4) diesel-fired fire pump engines (ID Nos. ES-18FPSAAF through 21FPSAAF) to the permitted equipment list, and - seven (7) natural gas-fired boilers (ID Nos. IES-910B through 916B) to the insignificant activity list.
04379T40	August 26, 2014	A. To Request the installation of small boilers (≤ 3.0 mmBtu/hour), ho heaters, and emergency generators. B. Administrative changes:

Permit	Issue Date	Description
		1. Revise the insignificant activity source ID number (IES-04N) change the Building number from Bldg. to Bldg. 712. 2. Change the regulation citation for propane-fired hot water heaters, ID Nos. ES-00B169 through ES-00B173 from "MACT Subpart DDDDD" to "2D .1109 Case-By-Case MACT". These units were originally applied for as being subject to Case-by-Case MACT in a previous application. The wrong citation was placed in the Air Permit.
04379T39	January 24, 2014	A. To Request the installation of small boilers (≤ 2.0 mmBtu/hour), hot water heaters, emergency generators, one makeup air unit heater, one fueling operation, one composting operating and one sanding operation. B. Administrative changes: 1. Five emergency generators removed (ES-123GI, 125GI, 126GI, 114GI, 32G) from site. 2. One Outboad Engine Test Stand (IES-06E) removed from site. 3. One boiler (ES-646B) removed from site. 4. Change the Btu rating of boiler (ES-619B) from 0.15 mmBtu/hour to 0.50 mmBtu/hour.
04379T38	October 28, 2013	A. To withdraw the request for the "placeholder units" (future units to be installed at the facility that did not currently have defined geographic locations) submitted in the initial application. B. Request the installation of additional units with defined locations and equipment specifications included in the initial application. C. Administrative amendments: 1. Changed building number of IES-02W to building 251. 2. Remove MACT Subpart DDDDD applicability from units that do not meet the definition of a boiler or process heater and remove applicability for hot water heaters below the volume threshold of Subpart DDDDD that were permitted in Revision T37. a. ES-613B, 614B, 623B, 624B, 625B, 630B through 633B, 634B through 636B, 645B, and 655B through 658B. D. Equipment to be added or removed: 1. Small natural gas-fired and/or fuel oil-fired boilers and water heaters at various locations on the Base. 2. Remove Diesel-fired emergency generators from various locations on the Base, remove IES-14W. 3. Add natural gas-fired makeup air unit. 4. Add natural gas-fired infrared heaters. 5. Add two non-destructive inspection (NDI) operations (IES-04N and 05N). 6. Add one above ground storage tank (IES-16T12825). 7. Removed waste water treatment plant and wood working operation.

Permit	Issue Date	Description
04379T37	July 29, 2013	Fulfill the requirement in the existing permit (Revision T36) to send modified sources through public notice and EPA review and add additional sources as described below. Due to the operational tempo and structure of a military facility, projects are frequently appropriated separately by the US Congress, projects are separated by each funding code and evaluated independently. The project numbers for each of the proposed pieces of equipment in these applications are shown for the purposes of evaluating pollutant emissions and for PSD. 1. Add small natural gas-fired and/or fuel oil-fired boilers and water heaters at various locations on the Base. 2. Add welding operations. 3. Remove Diesel-fired emergency generators from various locations on the Base. 4. Add one peak shaving/emergency generator unit (ES-17PSG, 2700 kW Diesel fuel-fired). 5. Add Diesel-fired fire pump (ES-ES-17FPO19F2). 6. Add natural gas-fired makeup air units. 7. Add natural gas-fired heating and ventilating units. 8. Add natural gas-fired infrared heaters. 9. Add natural gas heat recovery units. 10. Remove the peak shaving ability from existing engines ES-01PSG through ES-08PSG, ES-10PSG, and ES-16PSG . Remove the Schedule of compliance in Section 2.3. This requirement was fulfilled with application 2600102.12A.
04379T36	April 26, 2012	A. Add Diesel-fired emergency generators at various locations on the Base. B. Add small natural gas-fired boilers and water heaters at various locations on the Base. C. Add one tank purging system. D. Add one fire pump. E. Add several welding shops at various locations on the Base. F. Add one x-ray operation. G. Add storage tanks at various locations on the Base. H. Change the rating of emergency generators (ES-75G from 150 kW to 175 kW) and (ES-74G from 175 kW to 150 kW). I. Remove IES-3N, IES-80G, IES-99G, IES-01X, IES-130G, IES-03AB, IES-01PWT, IES-01WWTP, and ES-11C from the permit. J. Remove the option to burn on-specification used oil from all boilers. K. Add remediation system (IES-01RDL) Removed all emergency generators from the insignificant activities list. These are now listed in the Permit as significant sources due to MACT applicability. ID numbers were changed. (Example: IES-57G is now ES-57GI)
04379T35	October 27, 2011	Previous renewal permit.

XII. Other Regulatory Considerations

- An application fee is not required for this renewal application.
- A zoning consistency determination is not required for this renewal application.
- A Professional Engineer's Seal is not required for this renewal application.
- DAQ Title V Equipment Editor (TVEE) database update was approved on February 10, 2017.

XIII. Draft/Proposed Permit Review Summary

- Mr. Greg Reeves, Permit Coordinator (FRO) was provided a draft permit for review on January 31, 2017. FRO responded on February 3, 2017 with no comments.
- Mr. Gary Cullen (Ft. Bragg) was provided a draft permit for review on January 31, 2017. Ft. Bragg responded on February 3, 2017 with minor comments. All comments were addressed.
- NCDAQ published a Public Notice of the proposed Title V permit renewal on XXXX on DAQ website. The public comment period expired on XXXX with no comments received.
- U.S. EPA Region IV was provided a draft permit for review on XXXX. EPA comment period expired on XXXX with no comments received.

XIV. Recommendations

This Title V Permit Renewal for Ft. Bragg Army Post, Cumberland County, North Carolina has been reviewed by DAQ to determine compliance with all procedures and requirements. DAQ has determined that this facility appears to be complying or is expected to achieve compliance as specified in the permit with all applicable requirements. DAQ recommends issuance of the permit renewal.

ATTACHMENT A

NORTH CAROLINA DIVISION OF AIR QUALITY

Air Permit Review

Permit Issue Date: June 15, 2016

Region: Fayetteville Regional Office
County: Cumberland
NC Facility ID: 2600102
Inspector's Name: Joshua L. Harris
Date of Last Inspection: 11/18/2015
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): HQ XVIII ABN Corps & Fort Bragg

Facility Address:
HQ XVIII ABN Corps & Fort Bragg
Bldg 3-1137
Fort Bragg, NC 28310

SIC: 9711 / National Security
NAICS: 92811 / National Security

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP: 15A NCAC 02D .0503, .0515, .0516, .0521
15A NCAC 02Q .0516
NSPS: 15A NCAC .0524 – Subpart IIII
NESHAP: 15A NCAC .1111 – Subpart ZZZZ and 112(j)
PSD: N/A
PSD Avoidance: N/A
NC Toxics: N/A
112(r): N/A
Other: N/A

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Gary Cullen Air Program Manager (910) 432-8464 IMBG-PWE-C Fort Bragg, NC 28310+5000	Gregory Bean Director, Directorate of Public Works (910) 396-4009 IMBG-PW Fort Bragg, NC 28310+5000	Gary Cullen Air Program Manager (910) 432-8464 IMBG-PWE-C Fort Bragg, NC 28310+5000

Application Data

Application Number: 2600102.15A
Date Received: 11/03/2015
Application Type: Modification
Application Schedule: TV-Significant

Existing Permit Data
Existing Permit Number: 04379/T41
Existing Permit Issue Date: 07/24/2015
Existing Permit Expiration Date: 09/30/2016

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2014	1.34	93.50	44.35	61.32	6.78	5.02	1.87 [Toluene]
2013	1.41	85.86	44.56	58.00	6.57	5.82	2.02 [Toluene]
2012	1.66	59.46	42.77	35.54	5.87	4.64	2.02 [Toluene]
2011	2.07	70.14	45.28	47.36	5.78	4.82	2.11 [Toluene]
2010	3.37	68.82	44.44	44.07	5.93	4.98	2.12 [Toluene]

Review Engineer: Kevin Godwin

Review Engineer's Signature: **Date:**

Comments / Recommendations:
Issue: 04379/T42
Permit Issue Date: 06/15/2016
Permit Expiration Date: 09/30/2016

I. Introduction and Purpose of Application

A. Ft. Bragg Army Post (Ft. Bragg) is home to both the 82nd Airborne Division and the XVIII Airborne Corps Headquarters. Ft. Bragg is a major source of both criteria pollutants and hazardous air pollutants (HAP). The current air permit 04379T41 covers sources including boilers, generators, incinerators, paint booths, engine test stands, and a cogeneration turbine.

B. Ft. Bragg is requesting that the current permit be modified as follows:

1. Add three (3) natural gas-fired boilers (ID Nos. ES-908B, 909B, and 910B, 4.2, 3.2, and 2.7 million Btu per hour heat input, respectively),
2. Add three (3) diesel-fired emergency generators (ID No. ES-198GI, 600 kilowatts and ID Nos. ES-196GI, ES-197GI, 100 kilowatts each),
3. Add eighteen (18) natural gas-fired boilers and one (1) No. 2 fuel oil-fired boiler as insignificant activities under ID No. IES-00B,
4. Add a soldering training and welding shop (ID Nos. IES-22W and IES-23W) as insignificant activities,
5. Remove eighteen (18) small boilers, ten (10) emergency generators, one (1) air stripper, and one (1) welding shop,
6. Add an existing brass deformer (ID No. ES-107BDI) to the insignificant activity list,
7. Move existing hot water heaters to the insignificant activity list under source ID No. IES-00B) as they are categorically exempt from MACT DDDDD and qualify as insignificant activities under 15A NCAC 02Q .0503(8).
8. Various administrative changes.

C. Because this modification does involve a significant change in existing monitoring and recordkeeping requirements it is classified as a significant modification under 15A NCAC 02Q .0516. The applicant has requested that the application be processed using the one-step procedures provided in 15A NCAC 02Q .0501(d)(1).

II. Changes to Existing Permit

The following table provides a summary of changes made with this revision.

Page No.	Section	Description of Change
Cover letter	N/A	Amended application type; permit revision numbers, and dates.
Attachment	Insignificant Activities	Included nineteen (19) new and existing natural gas-fired sources that meet the definition of hot water heater under 40 CFR 63 DDDDD. Included welding shop (ID No. IES-22W) and soldering training shop (ID No. IES-23W). Moved brass deformer (ID No. ES-107BDI) from permit to insignificant activity list.
1	Permit cover page	Amended permit revision numbers and all dates.
N/A	All, Header	Updated permit revision number.
Global	Global	Updated testing, monitoring, recordkeeping, and reporting regulatory citation to 15A NCAC 02Q .0508(f).
3, 69, and 71	Table of Emission Sources, 2.2 G.3. and 2.2 G.4.	Included new sources associated with this application (ID Nos. ES-908B, ES-909B, ES-910B, ES-196GI, ES-197GI, and ES-198GI. Removed eighteen (18) small boilers, ten (10) emergency generators, one air stripper, and one welding shop.
39	2.1 L.	Included new emergency generators (ID Nos. ES-196GI, ES-197GI, and ES-198GI).
Global	Global	Made administrative changes as outlined in the application to source ID Nos. ES-87GI, ES-38B, ES-39B, ES-01C, ES-02C, ES-08C, ES-09C, and ES12C. Included

Page No.	Section	Description of Change
		standard I & M, Recordkeeping, and Reporting requirements for control equipment.
79	2.2 M.	Included new boilers (ID No. ES-908B, ES-909B, and ES-910B.
3, 79	Table of Emission Sources, 2.2 M.	Moved 122 propane, natural gas, No. 2 fuel oil fired sources to insignificant activity list under source (ID No. IES-00B) as they are categorically exempt from 40 CFR 63 DDDDD and emissions are below significance levels listed in 15A NCAC 02Q .0503(8).
79	2.2 M	Moved sources meeting the definition of hot water heater per 40 CFR 63 DDDDD (ID Nos. ES-00BI, ES-649B, ES-762B, ES-822B, ES-823B, ES-824B, ES-00BI69, ES-BI70, ES-00BI71, ES-00BI72, and ES-00BI73) from permit to insignificant activity list under source ID No. IES-00B.
83	3 - General Conditions	Included General Conditions from most recent shell version (v4).

III. Statement of Compliance

The facility was most recently inspected on November 18, 2015 by Mr. Joshua Harris of the Fayetteville Regional Office (FRO). According to the Regional P&O Review, the facility was found to be in apparent compliance during this inspection.

Regarding the five-year compliance history, a Notice of Deficiency (NOD) was issued on August 25, 2015 for a late NESHAP Subpart ZZZZ notification.

IV. Regulatory Review – Specific Emission Source Limitations

A. Existing Specific Emission Source Limitations are not affected by this modification. The proposed new generators and boilers will be subject to the requirements of 15A NCAC 02D .0503, .0516, and .0521. However, because the sources only fire distillate fuel oil and/or natural gas, no monitoring, recordkeeping, or reporting is required to demonstrate compliance with the applicable regulations.

B. 15A NCAC 02D .0503 "Particulates from Fuel Burning Indirect Heat Exchangers" – This regulation applies to the new hot water heaters. For the purpose of this Rule, the maximum heat input shall be the total heat content of all fuels which are burned in a fuel burning indirect heat exchanger, of which the combustion products are emitted through a stack or stacks. The sum of maximum heat input of all fuel burning indirect heat exchangers at a plant site which are in operation, under construction, or permitted pursuant to 15A NCAC 2Q, shall be considered as the total heat input for the purpose of determining the allowable emission limit for particulate matter for each fuel burning indirect heat exchanger. The allowable limit is calculated by the following equation:

$$E = 1.090 * Q^{-0.2594}$$ where, E = allowable emissions in lb/million Btu
Q = maximum heat input in million Btu/hr

For these sources E calculates to 0.19 lb/million Btu. Natural gas combustion in these sources will not cause the limit to be exceeded. Therefore, compliance is demonstrated.

C. 15A NCAC 02D .0515 "Particulates from Miscellaneous Industrial Processes" – This regulation establishes an allowable emission rate for particulate matter from any stack, vent, or outlet resulting from any industrial process for which no other emission control standards are applicable. The regulation applies to Total Suspended Particulate (TSP) or PM less than 100 micrometers (µm). The allowable emission rate is calculated using the following equations:

$E = 4.10 \times P^{0.67}$ for $P < 30$ tph

$E = 55 \times P^{0.11} - 40$ for $P \geq 30$ tph

where, E = allowable emission rate (lb/hr)
P = process weight rate (tph)

The existing paint spray booths (ID Nos. ES-08C, 09C, and 12C) are subject to this regulation. The spray booths will be controlled with fabric filters. Inspection and maintenance, as recommended by the manufacturer, is required for the control equipment. Standard recordkeeping and reporting requirements are included in the revised permit.

D. 15A NCAC 02D .0516 "Sulfur Dioxide Emissions from Combustion Sources" - Emission of sulfur dioxide from any source of combustion that is discharged from any vent, stack, or chimney shall not exceed 2.3 pounds of sulfur dioxide per million BTU input. Natural gas combustion in these sources will not cause the limit to be exceeded. Therefore, compliance is demonstrated.

E. 15A NCAC 02D .0521 "Control of Visible Emissions" - For sources manufactured after July 1, 1971, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period. However, except for sources required to comply with Paragraph (g) of this Rule, six-minute averaging periods may exceed 20 percent opacity if:

(1) No six-minute period exceeds 87 percent opacity;
(2) No more than one six-minute period exceeds 20 percent opacity in any hour; and
(3) No more than four six-minute periods exceed 20 percent opacity in any 24-hour period.

Compliance with this rule is expected.

V. Regulatory Review – Multiple Emission Source Limitations

A. 15A NCAC 02D .0530 "Prevention of Significant Deterioration" – Ft. Bragg is a major PSD source with the potential to emit criteria pollutants greater than 250 tons per year.

As explained in the application, separate funding codes, in relation to federally-funded projects allow for disaggregation of emissions for PSD purposes. For simplification of this application, the emissions associated with this project have been summed. Calculations are included in Appendix B of the application. Because the summation of each of the proposed projects is less than the PSD significant emission rates, no single project exceeds a PSD threshold. Therefore, PSD review is not triggered for this application.

The PSD minor baseline dates for PM10, SO_2 and NOx have been triggered for Cumberland County. For PSD increment tracking purposes, PM10 emissions from this modification are increased by 0.2 pounds per hour, sulfur dioxide emissions from this modification are increased by 0.05 pounds per hour, and nitrogen dioxide emissions from this modification are increased by 2.8 pounds per hour.

B. 15A NCAC 02D.0524 "New Source Performance Standards – Subpart Dc" – None of the boilers addressed in this application are rated greater than 10 million Btu per hour. Therefore, this rule does not apply.

C. 15A NCAC 02D .0524 "New Source Performance Standards – Subpart IIII" – The diesel-fired generators at Ft. Bragg are subject to this rule. The application identifies three (3) new units (ID Nos. ES-196GI, ES-197GI, and ES-198GI) that are subject to the same requirements listed in condition 2.2 L. of the existing permit. Compliance is expected.

D. 15A NCAC 02D .1111 "Maximum Achievable Control Technology – Subpart DDDDD and 112(j)" – Ft. Bragg currently has boiler MACT requirements for new sources based on the March 2011 rule. These requirements include initial notifications, work practice standards, and compliance reporting. The new applicable sources requested in this application were all constructed after June 4, 2010 and therefore are subject to the same permit requirements in existing condition 2.2 M. Pursuant to the rule, new small gas and oil-fired boilers are required to perform a tune-up within 5 years of the compliance date and every 5 years thereafter. The notification of compliance status is due for each boiler within 60 days after the first

tune-up. Sources meeting the definition of "hot water heater" under the Boiler MACT are exempt from regulation per 40 CFR 63.7491(d). Section 2.2 M of the current permit includes hot water heaters under requirements for the Case-by-Case MACT. The DAQ has specified that hot water heaters, as defined in Section 16 of the NC DAQ Part 2 Application Guidance, are not affected sources under the Case-by-Case MACT. Therefore, the sources are removed from Section 2.2 M. The application identifies fifteen (15) new boilers subject to MACT. The sources removed are all less than 120 gallons capacity with the following ID Nos.:

> ES-00BI1 through ES-00BI25, ES-00BI46, ES-00BI53, ES-00BI55 through ES-00BI58, ES-00BI60 through ES-00BI62, ES-649B, ES-762B, ES-822B through ES-824B, and ES-00BI69 through ES-00BI73.

E. 15A NCAC 02D .1111"Maximum Achievable Control Technology – Subpart ZZZZ" – All stationary internal combustion engines at Ft. Bragg are subject to the RICE MACT. The application identifies three (3) diesel-fired emergency generators that will be subject to existing requirements found in conditions 2.2 G.3. and 2.2 G. 4.

F. 15A NCAC 02D .1100 "Control of Toxic Air Pollutants" – Ft. Bragg was required to submit a state-only toxics demonstration no later than January 13, 2012. The demonstration was required to include all permitted sources up through revision T35 with units operating at potential-to –emit rates. The results demonstrated that the modeled emission rates were in compliance with acceptable ambient levels (AAL) listed in 15A NCAC 02D .1104. No operating limitations were necessary to comply with the AAL.

Since the 2012 submittal, the Exemptions under 15A NCAC 02D .0702 were amended to include a categorical exemption for sources subject to a MACT standard. All sources in this application are subject to a MACT standard and thus meet the exemption. Addition of the natural gas-fired boilers and diesel-fired emergency generators does not pose an unacceptable health risk.

G. 15A NCAC 02D .0614"Compliance Assurance Monitoring" - The CAM rule applies to pollutant specific emission units at Title V facilities that are pre-control major sources and use a control device to comply with an emission limit. The CAM rule does not apply to units that are identified in this application. Therefore, CAM does not apply.

VI. Other Regulatory Considerations

- An application fee of $918.00 is required and was included with the application package.
- The appropriate number of application copies was received on November 3, 2015.
- A Professional Engineer's Seal is not required for this application.
- Ft. Bragg is located on Federal property and is therefore not subject to local zoning regulations. All of the proposed modifications have been approved by the installation planning and development authority and are in accordance with the Post master plan.
- Public notice is required for this significant modification under 15A NCAC 02Q .0501(d)(1).
- IBEAM TVEE update was verified on June 6, 2016.
- According to the application, the facility does not handle any of the substances subject to 112(r).
- The application was signed by Mr. Gregory G. Bean, Director, Directorate of Public Works, on October 30, 2015.

VII. Draft/Proposed Permit Review Summary

- Mr. Joshua Harris (FRO) was provided a draft permit for review on February 23, 2016. Mr. Harris responded with comments on February 24, 2016. All comments have been addressed.
- Mr. Gary Cullen (Ft. Bragg) was provided a draft permit for review on February 23, 2016. Mr. Cullen responded with comments on March 4, 2016. All comments have been addressed.
- NCDAQ published a Public Notice of the proposed Title V permit revision on DAQ website on April 19, 2016.
- EPA, Region 4 was provided a draft permit for review on April 19, 2016.

VIII. Recommendations

This permit application has been reviewed by DAQ to determine compliance with all procedures and requirements. DAQ has determined that this facility is expected to achieve compliance as specified in the permit with all applicable requirements.

No comments were received during the public comment or EPA review periods. Therefore, DAQ recommends issuance of the permit revision.

ATTACHMENT B

NORTH CAROLINA DIVISION OF AIR QUALITY

Air Permit Review

Permit Issue Date: July 24, 2015

Region: Fayetteville Regional Office
County: Cumberland
NC Facility ID: 2600102
Inspector's Name: Robert Hayden
Date of Last Inspection: 02/12/2015
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): HQ XVIII ABN Corps & Fort Bragg

Facility Address:
HQ XVIII ABN Corps & Fort Bragg
Bldg 3-1137
Fort Bragg, NC 28310

SIC: 9711 / National Security
NAICS: 92811 / National Security

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP: 15A NCAC 02D .0503, .0516, .0521
15A NCAC 02Q .0516
NSPS: 15A NCAC .0524 – Subpart IIII
NESHAP: 15A NCAC .1111 – Subpart ZZZZ and 112(j)
PSD: N/A
PSD Avoidance: N/A
NC Toxics: N/A
112(r): N/A
Other: N/A

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Gary Cullen Air Program Manager (910) 432-8464 IMSE-BRG-PWE-C Fort Bragg, NC 28310+5000	Gregory Bean Directorate of Public Works (910) 396-4009 (IMBG-PW / Ms. Stump) Fort Bragg, NC 28310+5000	Gary Cullen Air Program Manager (910) 432-8464 IMSE-BRG-PWE-C Fort Bragg, NC 28310+5000

Application Data

Application Number: 2600102.14B
Date Received: 11/05/2014, addendum received 04/10/2015
Application Type: Modification
Application Schedule: TV-Significant

Existing Permit Data
Existing Permit Number: 04379/T40
Existing Permit Issue Date: 08/26/2014
Existing Permit Expiration Date: 09/30/2016

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2013	1.41	85.86	44.56	58.00	6.57	5.82	2.02 [Toluene]
2012	1.66	59.46	42.77	35.54	5.87	4.64	2.02 [Toluene]
2011	2.07	70.14	45.28	47.36	5.78	4.82	2.11 [Toluene]
2010	3.37	68.82	44.44	44.07	5.93	4.98	2.12 [Toluene]
2009	4.60	58.35	47.80	38.68	4.80	5.53	2.20 [Toluene]

Review Engineer: Kevin Godwin

Review Engineer's Signature: **Date:**

Comments / Recommendations:
Issue 04379/T41
Permit Issue Date: 07/24/2015
Permit Expiration Date: 09/30/2016

I. Introduction and Purpose of Application

A. Ft. Bragg Army Post (Ft. Bragg) is home to both the 82nd Airborne Division and the XVIII Airborne Corps Headquarters. Ft. Bragg is a major source of both criteria pollutants and hazardous air pollutants (HAP). The current air permit 04379T40 covers sources including boilers, generators, incinerators, paint booths, engine test stands, and a cogeneration turbine.

B. Ft. Bragg is requesting that the current permit be modified as follows:

1. Add five (5) diesel-fired emergency generators and fifteen (15) small natural gas-fired boilers,
2. Add insignificant activities consisting of small natural gas-fired boilers, distillate fuel oil-fired boilers, and propane-fired boilers. These units fall under the definition of "hot water heater" as defined in 40 CFR 63 Subpart DDDDD as they are less than a maximum heat input of 1.6 million Btu per hour and produce hot water,
3. Remove two (2) small emergency generators and three (3) hot water heaters.
4. Add natural gas as a primary fuel for three (3) existing 8.3 million Btu per hour distillate fuel oil-fired boilers.
5. Correct applicability for small boiler not exempt under 40 CFR 63 Subpart DDDDD as "hot water heaters."
6. Several administrative corrections

On April 10, 2015, DAQ received an addendum to the application for the following additions:

- four (4) natural gas-fired boilers (ID Nos. ES-904B through 907B),
- one (1) diesel-fired emergency generator (ID No. ES-195GI),
- four (4) diesel-fired fire pump engines (ID Nos. ES-18FPSAAF through 21FPSAAF) to the permitted equipment list, and
- seven (7) natural gas-fired boilers (ID Nos. IES-910B through 916B) to the insignificant activity list.

Based on comments from Mr. Gary Cullen (Ft. Bragg), the sources (ID Nos. ES-904B, 905B, 910B, 911B, 916B) will not be installed.

C. Because this modification does involve a significant change in existing monitoring and recordkeeping requirements it is classified as a significant modification under 15A NCAC 02Q .0516. The applicant has requested that the application be processed using the one-step procedures provided in 15A NCAC 02Q .0501(d)(1).

II. Changes to Existing Air Permit

The following table provides a summary of the changes in Permit No. 04379T40.

Old Page No.	New Page No.	Condition No.	Description of Change
N/A	Global	Global	Updated permit number, permit format, and dates.
N/A	N/A	Insignificant Activity List	Included IES-00B which represents a consolidation of numerous hot water heaters as defined in MACT Subpart DDDDD and changed description for source IES-09C.
3	3	Table of Emission Sources	Reformatted table.
3	3	Table of Emission Sources	Included natural gas as primary fuel for three boilers (ID Nos. ES-30B through 32B).

Old Page No.	New Page No.	Condition No.	Description of Change
4	N/A	Table of Emission Sources	Removed sources determined to be hot water heaters as defined in MACT Subpart DDDDD.
8	N/A	Table of Emission sources	Removed ID No. ES-766B.
N/A	4	Table of Emission Sources	Included 20 natural gas-fired boilers subject to MACT Subpart DDDDD.
10	N/A	Table of Emission Sources	Removed ID No. ES-826B.
17	N/A	Table of Emission Sources	Removed ID Nos. ES-128GI and 139GI.
18	N/A	Table of Emission Sources	Removed ID No. ES-159GI.
N/A	11	Table of Emission Sources	Included 6 diesel-fired emergency generators subject to MACT Subpart ZZZZ and NSPS Subpart IIII.
N/A	12	Table of Emission Sources	Included 4 fire pump engines subject to MACT Subpart ZZZZ and NSPS Subpart IIII.
22	14	Table of Emission Sources	Made corrections to source descriptions for ES-09C, ES-01E, and ES02D.
35	27	2.1 F.	Included natural gas as primary fuel for three boilers (ID Nos. ES-30B through 32B).
N/A	45	2.1 L.	Included 6 emergency generators (ID No. ES-190GI through 195GI) and 4 fire pumps (ID Nos. ES-18FPSAAF through 21FPSAAF).
N/A	76	2.2 G.3.	Included 3 emergency generators (ID Nos. ES-193GI through 195GI) and 4 fire pumps (ID Nos. ES-18FPSAAF through 21FPSAAF).
N/A	77	2.2 G.4.	Included 3 emergency generators (ID Nos. ES-190GI through 192GI).
N/A	82	2.2 L.	Included 6 emergency generators (ID Nos. ES-190GI through 195GI) and 4 fire pumps (ID Nos. ES-18FPSAAF through 21FPSAAF).
N/A	85, 86	2.2 N.	Included 20 natural gas-fired boilers.

III. Statement of Compliance

The facility was most recently inspected on February 12, 2015 by Mr. Robert Hayden, Fayetteville Regional Office (FRO). According to the Regional P&O Review, the facility was found to be in apparent compliance during this inspection.

Regarding the five-year compliance history, there have been no compliance issues.

The Regional P&O Review identifies recommended changes to existing semi-annual/quarterly reporting requirements. The changes noted will be addressed with the upcoming permit renewal.

III. Regulatory Review – Specific Emission Source Limitations

Existing Specific Emission Source Limitations are not affected by this modification. The proposed new generators and boilers will be subject to the requirements of 15A NCAC 02D .0503, .0516, and .0521.

However, because the sources only fire distillate fuel oil and/or natural gas, no monitoring, recordkeeping, or reporting is required to demonstrate compliance with the applicable regulations.

IV. Regulatory Review – Multiple Emission Source Limitations

G. 15A NCAC 02D .0530 "Prevention of Significant Deterioration" – Ft. Bragg is a major PSD source with the potential to emit criteria pollutants greater than 250 tons per year.

As explained in the application, separate funding codes, in relation to federally-funded projects allow for disaggregation of emissions for PSD purposes. For simplification of this application, the emissions associated with this project have been summed. Calculations are included in Appendix B of the application. Because the summation of each of the proposed projects is less than the PSD significant emission rates, no single project exceeds a PSD threshold. Therefore, PSD review is not triggered for this application.

The current permit includes a PSD avoidance condition for SO_2 emissions from the three (3) 8.3 million Btu per hour No. 2 fuel oil-fired boilers (ID Nos. ES-30B, 31B, and 32B). This application requests the sources be modified to allow firing of natural gas as primary fuel. This change in operation will not cause an increase in SO2 emissions above the 40 tpy limitation found in 2.1(F)(3)(a).

The PSD minor baseline dates for PM10, SO_2 and NOx have been triggered for Cumberland County. For PSD increment tracking purposes, PM10 emissions from this modification are increased by 1.06 pounds per hour, sulfur dioxide emissions from this modification are increased by less than 1 pound per hour, and nitrogen dioxide emissions from this modification are increased by 15.32 pounds per hour.

H. 15A NCAC 02D.0524 "New Source Performance Standards – Subpart Dc" – None of the boilers addressed in this application are rated greater than 10 million Btu per hour. Therefore, this rule does not apply.

I. 15A NCAC 02D .0524 "New Source Performance Standards – Subpart IIII" – The diesel-fired generators at Ft. Bragg are subject to this rule. The application identifies five (5) new units (ID Nos. ES-190GI through 194GI) that are subject to the same requirements listed in condition 2.2 L. of the existing permit. Compliance is expected.

J. 15A NCAC 02D .1111 "Maximum Achievable Control Technology – Subpart DDDDD and 112(j)" – Ft. Bragg currently has boiler MACT requirements for new sources based on the March 2011 rule. These requirements include initial notifications, work practice standards, and compliance reporting. The new applicable sources requested in this application were all constructed after June 4, 2010 and therefore are subject to the same permit requirements in existing condition 2.2 N. Pursuant to the rule, new small gas and oil-fired boilers are required to perform a tune-up within 5 years of the compliance date and every 5 years thereafter. The notification of compliance status is due for each boiler within 60 days after the first tune-up. Sources meeting the definition of "hot water heater" under the Boiler MACT are exempt from regulation per 40 CFR 63.7491(d). The application identifies fifteen (15) new boilers subject to MACT.

This application proposes to reconfigure fuel firing for three existing distillate fuel oil-fired boilers (ID Nos. ES-30B, 31B, and 32B) to allow natural gas as primary fuel. These boilers were installed prior to June 4, 2010. Under the Boiler MACT, they are considered existing units and this change would not be considered a reconstruction. The boilers are currently covered under 112(j) Case-by-Case Boiler MACT requirements found in condition 2.2 M. Under 2.2 M., these boilers are subject to work practice standards and associated recordkeeping requirements. The addition of natural gas as primary fuel will not cause the applicable compliance requirements to change. Compliance is expected.

K. 15A NCAC 02D .1111"Maximum Achievable Control Technology – Subpart ZZZZ" – All stationary internal combustion engines at Ft. Bragg are subject to the RICE MACT. The application identifies five (5) diesel-fired emergency generators that will be subject to existing requirements found in conditions 2.2 G.3. and 2.2 G. 4.

L. 15A NCAC 02D .1100 "Control of Toxic Air Pollutants" – Ft. Bragg was required to submit a state-only toxics demonstration no later than January 13, 2012. The demonstration was required to include all permitted sources up through revision T35 with units operating at potential-to –emit rates. The results demonstrated that the modeled emission rates were in compliance with acceptable ambient levels (AAL) listed in 15A NCAC 02D .1104. No operating limitations were necessary to comply with the AAL.

Since the 2012 submittal, the Exemptions under 15A NCAC 02D .0702 were amended to include a categorical exemption for sources subject to a MACT standard. All sources in this application are subject to a MACT standard and thus meet the exemption. Addition of the natural gas-fired boilers and diesel-fired emergency generators does not pose an unacceptable health risk.

M. 15A NCAC 02D .0614"Compliance Assurance Monitoring" - The CAM rule applies to pollutant specific emission units at Title V facilities that are pre-control major sources and use a control device to comply with an emission limit. The CAM rule does not apply to units that are uncontrolled such as the sources identified in this application. Therefore, CAM does not apply.

VI. Other Regulatory Requirements

- An application fee of $904.00 is required and was received by DAQ.
- The appropriate number of application copies was received on November 5, 2014.
- The application included the Reduction and Recycling Form (A4).
- A Professional Engineer's Seal is not required for this application.
- Ft. Bragg is located on Federal property and is therefore not subject to local zoning regulations. All of the proposed modifications have been approved by the installation planning and development authority and are in accordance with the Post master plan.
- Public notice is required for this significant modification under 15A NCAC 02Q .0501(d)(1).
- IBEAM TVEE update was verified on July 7, 2015.
- According to the application, the facility does not handle any of the substances subject to 112(r).
- The application was signed by Mr. Gregory G. Bean, Director, Directorate of Public Works, on November 11 2014.

XII. Draft/Proposed Permit Review Summary

- Mr. Robert Hayden (FRO) was provided a draft permit for review on May 22, 2015.
- Mr. Gary Cullen (Ft. Bragg) was provided a draft permit for review on May 21, 2015. Mr. Cullen responded on May 27, 2015 with recommendations for minor corrections. The recommended corrections were made.
- NCDAQ published a Public Notice of the proposed Title V permit revision on DAQ website on June 3, 2015. EPA, Region 4 was provided a draft permit for review on June 3, 2015.

VII. Recommendations

This permit application has been reviewed by DAQ to determine compliance with all procedures and requirements. DAQ has determined that this facility is expected to achieve compliance as specified in the permit with all applicable requirements.

No comments were received during the public comment or EPA review periods. Therefore, DAQ recommends issuance of the permit revision.

ATTACHMENT C

NORTH CAROLINA DIVISION OF AIR QUALITY

Air Permit Review – Minor Modification in accordance with 15A NCAC 2Q. 0515

Permit Issue Date: August 26, 2014

Region: Fayetteville Regional Office
County: Cumberland
NC Facility ID: 2600102
Inspector's Name: Robert Hayden
Date of Last Inspection: 03/12/2014
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): HQ XVIII ABN Corps & Fort Bragg

Facility Address:
HQ XVIII ABN Corps & Fort Bragg
Bldg 3-1137
Fort Bragg, NC 28310

SIC: 9711 / National Security
NAICS: 92811 / National Security

Facility Classification: Before: Title V After: Title V
Fee Classification: Before: Title V After: Title V

Permit Applicability (this application only)

SIP: SIP: 15A NCAC 2Q .0515
NSPS: Subpart IIII
NESHAP: Subpart ZZZZ, Subpart DDDDD
PSD: N/A
PSD Avoidance: Will be evaluated for each project and funding code.
112(r): N/A
Other: N/A
NC Toxics: A toxics evaluation will be performed in accordance with 15A NCAC 2Q .0711(a)(27). Both boilers and engines are subject to a MACT regulation.

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Gary Cullen Air Program Manager (910) 432-8464 IMSE-BRG-PWE-C Ft Bragg, NC 28310+5000	Gregory Bean Directorate of Public Works (910) 396-4009 (IMBG-PW / Ms. Stump) Fort Bragg, NC 28310+5000	Gary Cullen Air Program Manager (910) 432-8464 IMSE-BRG-PWE-C Ft Bragg, NC 28310+5000

Application Data
Application Number: 2600102.14A
Date Received: 05/13/2014
Application Type: Modification
Application Schedule: Minor

Existing Permit Data
Existing Permit Number: 04379T39
Existing Permit Issue Date: 01/24/2014
Existing Permit Expiration Date: 09/30/2016

Consultant: URS Group Inc. Contact: Gary Cullen Phone: (910) 432-8464 email: gary.l.cullen4@mail.mil

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2012	1.66	59.46	42.77	35.54	5.87	4.64	2.02 [Toluene]
2011	2.07	70.14	45.28	47.36	5.78	4.82	2.11 [Toluene]
2010	3.37	68.82	44.44	44.07	5.93	4.98	2.12 [Toluene]
2009	4.60	58.35	47.80	38.68	4.80	5.53	2.20 [Toluene]
2008	4.53	59.28	60.12	38.12	3.94	7.25	2.89 [Toluene]

Review Engineer: Booker Pullen
Regional Engineer: Robert Hayden

Review Engineer's Signature: Begin Date: July 2014

Comments / Recommendations:
Issue: 04379T40
Permit Issue Date: August 26, 2014
Permit Expiration Date: 09/30/2016

I. Introduction/Description:

Fort Bragg Army Post is home to both the 82nd Airborne Division and the XVIII Airborne Corps Headquarters. Additionally, Fort Bragg hosts the U. S. Army Special Operations Command, the U. S. Army Parachute Team (the Golden Knights), FORSCOM, and U. S. Army Reserve. The Fort Bragg Military Base is located at 2175 Reilly Road, Stop A, Cumberland County, Fort Bragg, North Carolina. Application No. 2600102.14A was received by the Raleigh Central Office, Division of Air Quality (DAQ) on May 13, 2014 and considered complete on that date. This application will be processed in accordance with 15A NCAC 2Q .0515. This permit modification will not have to go through a 30-day public notice at this time. However, since this modification is a "Minor Modification", it will go through a 60 day EPA review period. This modification will not obtain the permit shield until it goes through the 30-day public comment period, along with a 45-day EPA review period at renewal or a significant modification.

A. The procedures set out in Rule 15A NCAC 2Q .0515 may be used for permit modifications when the modifications:
   1. do not violate any applicable requirement;
   2. do not involve significant changes to existing monitoring, reporting, or recordkeeping requirements in the permit;
   3. do not require or change a case-by-case determination of an emission limitation or other standard, or a source-specific determination for temporary sources of ambient impacts, or a visibility or increment analysis;
   4. do not seek to establish or change a permit term or condition for which there is no corresponding underlying applicable requirement and that the facility has assumed to avoid an applicable requirement to which the facility would otherwise be subject. Such terms and conditions include:
      a. a federally enforceable emissions cap assumed to avoid an applicable requirement under any provision of Title I of the federal Clean Air Act; or
      b. an alternative emissions limit approved as part of an early reduction plan submitted pursuant to Section 112(i)(5) of the federal Clean Air Act;
   5. are not modifications under any provision of Title I of the federal Clean Air Act; and
   6. are not required to be processed as a significant modification under Rule 15A NCAC 2Q .0516.

II. Purpose of Application 2600102.14A:

A. To Request the installation of small boilers (≤ 3.0 mmBtu/hour), hot water heaters, and emergency generators.

B. Administrative changes:
   1. Revise the insignificant activity source ID number (IES-04N) to change the Building number from Bldg. P3262 to Bldg. 712.
   2. Change the regulation citation for propane-fired hot water heaters, ID Nos. ES-00B169 through ES-00B173 from "MACT Subpart DDDDD" to "2D .1109 Case-By-Case MACT". These units were originally applied for as being subject to Case-by-Case MACT in a previous application. The wrong citation was placed in the Air Permit.

III. The modifications to the Fort Bragg Title V Air Permit will include the following separate projects funded by different tenants as listed in 2600102.14A:

Building No.	ID No.	Fuel Type	Rating (mmBtu/hr	Description
PN69624				
18th Airborne Corps Mission Co Facility	ES-787B	Natural gas	0.60	Boiler
SC00017-3P				
3-2151	ES-788B	Natural gas	0.40	Boiler
3-2243	ES-789B	Natural gas	0.45	Boiler
3-3242	ES-790B	Natural gas	0.36	Boiler
Building No.	ID No.	Fuel Type	Rating (mmBtu/hr	Description
PN69287				
3RD SFG BOF at Old ASP	ES-791B	Natural gas	1.50	Boiler

	ES-792B	Natural gas	1.50	Boiler
	ES-793B	Natural gas	1.35	Hot water heater
	ES-794B	Natural gas	1.35	Hot water heater
PN69458				
SOFT Battalion Ops Complex/ 4 MISG	ES-795B	Natural gas	0.40	Boiler
	ES-796B	Natural gas	0.40	Boiler
	ES-797B	Natural gas	0.80	Hot water heater (940 gallons)
	ES-798B	Natural gas	0.80	Hot water heater (940 gallons)
PN71224				
SOFT Group HQ MISOC(A)	ES-799B	Natural gas	0.5	Boiler
	ES-800B	Natural gas	0.5	Boiler
PN64340				
C-2831	ES-801B	Natural gas	0.3	Hot water heater (130 gallons)
FA42003-1				
282	ES-802B	Natural gas	1.3	Boiler
	ES-803B	Natural gas	1.3	Boiler
	ES-804B	Natural gas	1.3	Boiler
FA41006				
C-6238	ES-805B	Natural gas	1.08	Boiler
C-5838	ES-806B	Natural gas	1.0	Hot water heater (650 gallons)
	ES-807B	Natural gas	1.57	Boiler
	ES-808B	Natural gas	1.57	Boiler
FZ40021-1P				
2-2405	ES-809B	Natural gas	0.4	Boiler
FA41007-9P				
C-7950	ES-810B	Natural gas	0.9	Boiler
FA410005-9P				
C-5934	ES-811B	Natural gas	0.9	Boiler
PN75079				
1-1460	ES-812B	Natural gas	0.5	Boiler
FA42401-0P				
4-1843	ES-813B	Natural gas	0.5	Boiler
FA40204-9P				
4-2171	ES-814B	Natural gas	1.8	Boiler
4-2175	ES-815B	Natural gas	0.65	Boiler
SB00271-8P				
H-3718	ES-816B	Natural gas	1.43	Hot water heater
PN69798				
4-2027	ES-817B	Natural gas	0.4	Boiler
	ES-818B	Natural gas	0.4	Boiler
	ES-819B	Natural gas	2.0	Boiler
	ES-820B	Natural gas	2.0	Boiler
FA42404-0P				
D-3116	ES-821B	Natural gas	0.75	Boiler
SB00067-3P				
1-2539	ES-822B	Natural gas	0.5	Boiler
SB00068-3P				
1-2739	ES-823B	Natural gas	0.5	Boiler

Building No.	ID No.	Fuel Type	Rating (mmBtu/h	Description
TA00048-5P				
D-2502	ES-824B	Natural gas	1.0	Boiler
BRAC				
284	ES-825B	Natural gas	3.0	Hot water heater (400 gallons)

SC00007-2P				
3-3055	ES-826B	No. 2 Fuel oil	1.05	Boiler
PN69275				
E-3468	ES-827B	No. 2 Fuel oil	0.4	Hot water heater (400 gallons)
PN60743				
E-4268	ES-828B	No. 2 Fuel oil/ Natural gas	0.64	Boiler
	ES-829B	No. 2 Fuel oil/ Natural gas	0.64	Boiler
PD00002-3P				
519	ES-187GI	Diesel fuel	400 kW	Emergency generator
SC00008-3P				
3-3240	ES-188GI	Diesel fuel	60 kW	Emergency generator
3-3135	ES-189GI	Diesel fuel	80 kW	Emergency generator

IV. Changes to existing permit per application 2600102.14A:

Old Page No.	New Page No.	Condition No.	Changes
Cover Letter			
Page 1	Page 1	Heading and body of letter	Added current cover sheet, revised issue date, changed permit revision number, changed "complete application" received date, changed description of modification type in first sentence,
Page 2	Page 2	Heading and body of letter	Revised date at top of letter, changed the effective date of permit, changed values for NOx, SO_2 and PM10 hourly contributions from the addition of the new sources in this application, changed DAQ signature to William Willets, chief
Page 3	Page 3	"Changes to Permit" Table	Updated the table to reflect the changes per this modification
Insignificant Activities List			
N/A	Page 2 of 5	Table of Sources	Changed Building number for IES-04N
Body of the Permit			
Page 1	Page 1	Cover Page	Changed: effective date of permit, issue date, revision number, application number, received date of application, "replaces permit" number, DAQ signature to William Willets
N/A	All pages	Heading	Changed permit revision to T40
Page 9	Page 11	Table of Permitted Sources	Corrected regulatory citation for boilers ES-00B169 through ES-00173 to case by case MACT
N/A	Pages 9-10		Added boilers ES-787B through ES-829B to table
N/A	Page 19		Added emergency generators ES-187GI, 188GI, and 189GI
N/A	Page 53	Specific Conditions and Limitations	Added emergency generators ES-187GI, 188GI, and 189GI
N/A	Page 83		Added emergency generators ES-188GI, and 189GI
N/A	Page 84		Added emergency generator ES-187GI
N/A	Page 90		Added emergency generators ES-187GI, 188GI, and 189GI
N/A	Page 92-93	Multiple Emissions Section	Added boilers ES-822B, ES-823B, ES-824B, and ES-825B, placed all case-by-case MACT boilers into a table format
N/A	Pages 95-96		Added boilers ES-787B through ES-821B, ES-826B through ES829B

V. Statement of Compliance:

The DAQ has reviewed the compliance status of this facility. Mr. Robert Hayden of the FRO, performed a facility inspection on March 12, 2014 and the facility appeared to be in compliance with all applicable requirements.

VI. Source-by Source Evaluation for Modification Revision T40:

A. Emergency generators:

- ES-187GI (Diesel fuel-fired emergency generator, 400 kW, 536 hp)
- ES-188GI (Diesel fuel-fired emergency generator, 60 kW, 80 hp)
- ES-189GI (Diesel fuel-fired emergency generator, 80 kW, 107 hp)

1. Description:
   All of the emergency generators are fired by Diesel fuel only. For potential emission calculations, 500 maximum hours of operation were used per the 1995 EPA guidance from John S. Seitz, Director of the Office of Air Quality Planning and Standards. The emission of pollutants from each generator unit is uncontrolled.

2. Applicable Regulatory Requirements:

   All of the emergency generator engines in this application are subject to NSPS (Subpart IIII), and MACT (Subpart ZZZZ). Subpart ZZZZ was revised, and re-published in the Federal Register on January 18, 2008 with an effective date of March 18, 2008. This revision included engines with capacities greater than 500 brake horsepower and engines with capacities less than 500 brake horsepower located at major sources of HAP emissions.

   40 CFR Part 60, New Source Performance Standard, Subpart IIII:
   - Per 40 CFR §60.4200(a) NSPS, Subpart IIII does apply to these emergency generators because of their manufacture date.

   40 CFR Part 63, Maximum Achievable Control Technology, Subpart ZZZZ
   - Per 40 CFR §63.6590(a)(2)(ii), a stationary RICE with a site rating of equal to or less than 500 brake hp located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12, 2006. A stationary RICE with a site rating of more than 500 brake hp located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after December 19, 2002.

   - Per 40 CFR §63.6590(c)(6) "Stationary RICE Subject Regulations under 40 CFR Part 60" a new compression ignition emergency generator with a site rating less than 500 brake horsepower located at a major source of HAP emissions can meet the requirements of Subpart ZZZZ by meeting the requirements of NSPS Subpart IIII. No further requirements apply for such engines under this part.

   - Per 40 CFR §63.6600(c), an applicant that operates stationary emergency RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, does not need to comply with the emission limitations in Tables 1a, 2a, 2c, and 2d to this subpart or operating limitations in Tables 1b and 2b to this Subpart.

The following provides a summary of limits and/or standards for the emission sources described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Visible emissions	20 percent opacity	15A NCAC 2D .0521
Sulfur dioxide	Burn fuel that contains less than 15 parts per million sulfur content	15A NCAC 2D .0524 40 CFR Part 60 Subpart IIII
Hazardous Air Pollutants	Meet the requirements of NSPS Subpart IIII for emergency units less than 500 hp • ES-188GI (60 kW, 80 hp) • ES-189GI (80 kW, 107 hp) Meet requirements of 40 CFR 63.6640(f) for emergency units greater than 500 hp • ES-187GI (400 kW, 536 hp)	15A NCAC 2D .1111 40 CFR Part 63, Subpart ZZZZ
NMHC + NOx, HC, NOx, CO, PM	For emergency engines: Purchase engine certified to meet the applicable engine design emission limits	15A NCAC 2D .0524 40 CFR Part 60 Subpart IIII

Toxic air pollutants	Evaluation required by the DAQ	15A NCAC 2Q .0711(a)(27)

a. 15A NCAC 2D .0521"Control Of Visible Emissions"

Regulation Analysis:

i. Generators will be installed after July 1, 1971, and each is therefore subject to the State regulation 15A NCAC 2D .0521(d). Per this regulation visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute periods averaging more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period for each boiler.

Compliance is expected with this regulation because all of the generators will be firing diesel fuel.

Monitoring/Recordkeeping/Reporting [15A NCAC 2Q .0508(f)]

ii. No monitoring, recordkeeping, or reporting is required for visible emissions from the firing of diesel fuel in any engine because it should always be in compliance with the opacity standard during normal operation.

b. 15A NCAC 2D .1111, 40 CFR Part 63, Subpart ZZZZ: National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines

i. General Provisions [40 CFR §63.6665]:
The Permittee shall comply with the requirements of 40 CFR part 63 Subpart A "General provisions," according to the applicability of Subpart A to such sources, as identified in Table No. 8 in Subpart ZZZZ, "Applicability of General Provisions to Subpart ZZZZ".

ii. Compliance/Notification Procedures [40 CFR §63.6645]
Per 40 CFR §63.6590(c) "Stationary RICE Subject Regulations Under 40 CFR Part 60", new emergency compression ignition generators less than 500 brake horsepower site rating must only meet the requirements of NSPS, Subpart IIII.

Per 40 CFR §63.6600(c), an applicant that operates a stationary emergency RICE with a site rating of more than 500 brake horsepower located at a major source of HAP emissions, does not need to comply with the emission limitations in Tables 1a, 2a, 2c, and 2d to this subpart or operating limitations in Tables 1b and 2b to this Subpart.

iii. Recordkeeping Requirement For Applicability Determination [40 CFR §63.10(b)(3)]
The applicability determination for exclusion of the emergency generators from the requirements of 40 CFR Part 63, Subpart ZZZZ and Subpart A of this part, shall be maintained on site for a period of 5 years after the determination, or until the source changes its operations to become an affected source, whichever comes first. The analyses, or other information, that demonstrates the exemption from the requirements of Subpart ZZZZ and part A of this subpart, shall be signed by the person making the determination.

iv. Monitoring/Reporting [15A NCAC 2Q .0508(f)]

- Owner/operators who purchase an emergency generator that is less that 30 liters per cylinder must purchase units that are certified by the manufacturer to meet the applicable engine design emission limits. {§60.4211 (c)}.
- Owners/operators must operate and maintain engines and control devices in accordance with the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the life of the engine. {§60.4206 and §60.4211 (a)}.
- No testing is required for units less than 30 liter per cylinder displacement that have been certified by the manufacturer to meet design limits.
- Install a nonresettable hour meter {§60.4209(a)}.

c. 15A NCAC 2D .0524: NEW SOURCE PERFORMANCE STANDARDS, SUBPART IIII

Applicability [15A NCAC 2Q .0508(f), 40 CFR 60.4200(a)(2(i))]

i. For each engine, the Permittee shall comply with all applicable provisions, including the requirements for emission standards, notification, testing, reporting, record keeping, and monitoring, contained in Environmental Management Commission Standard 15A NCAC 2D .0524 "New Source Performance Standards (NSPS)" as promulgated in 40 CFR Part 60 Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines," including Subpart A "General Provisions."

General Provisions [15A NCAC 2Q .0508(f)]

ii. Pursuant to 40 CFR 60 .4218, The Permittee shall comply with the General Provisions of 40 CFR 60 Subpart A as presented in Table 8 of 40 CFR 60 Subpart IIII.

Emission Standards [15A NCAC 2Q .0508(f)]

iii. The Permittee shall comply with the emission standards for new non-road CI engines in 40 CFR 60.4202, for all pollutants, for the same model year and maximum engine power for this source. [40CFR 60.4205(b)]

Fuel Requirements [15A NCAC 2Q .0508(f)]

iv. The Permittee shall use diesel fuel in the engine with:
   a. a maximum sulfur content of 15 ppm; and
   b. a minimum cetane index of 40 or a maximum aromatic content of 35 volume percent. [40CFR 60.4207(b) and 40CFR 80.510(b)]

Testing [15A NCAC 2Q .0508(f)]

v. If emission testing is required, the testing shall be performed in accordance with General Condition JJ. If the results of this test are above the limits given above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524.

Monitoring [15A NCAC 2Q .0508(f)]

vi. The engine has the following monitoring requirements:
   (A) The engine shall be equipped with a non-resettable hour meter prior to startup. [40CFR 60.4209(a)]
   (B) The engine, if equipped with a diesel particulate filter, must be installed with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached. [40CFR 60.4209(b)]

Compliance Requirements [15A NCAC 2Q .0508(b)]

vii. The Permittee shall:
   (A) Operate and maintain the engines and control devices according to the manufacturer's emission related-written instructions over the entire life of the engine;
   (B) Change only those emission-related settings that are permitted by the manufacturer; and
   (C) Meet the requirements of 40 CFR 89, 94 and/or 1068 as applicable. [40CFR 60.4206 and 60.4211(a)]

viii. The Permittee shall comply with the emission standards for emergency generators by purchasing an engine certified to the emission standards in 40 CFR 60.4202. The engine shall be installed and configured according to the manufacturer's emission-related specifications. [40CFR 60.4211(c)]

ix. In order for the engine to be considered an emergency stationary ICE under this condition, any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in non- emergency situations for 50 hours per year, as described below, is prohibited.
   (A) There is no time limit on the use of emergency stationary ICE in emergency situations.

(B) The Permittee may operate the emergency stationary ICE for any combination of the purposes specified above for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed avove counts as part of the 100 hours per calendar year.

(1) Emergency stationary ICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE beyond 100 hours per calendar year.

(2) Emergency stationary ICE may be operated for emergency demand response for periods in which the Reliability Coordinator under the North American Electric Reliability Corporation (NERC) Reliability Standard EOP–002–3, Capacity and Energy Emergencies (incorporated by reference, see 40 CFR 60.17), or other authorized entity as determined by the Reliability Coordinator, has declared an Energy Emergency Alert Level 2 as defined in the NERC Reliability Standard EOP–002–3.

(3) Emergency stationary ICE may be operated for periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.

(C) Emergency stationary ICE may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response provided in paragraph (i)(2) of this condition. Except as provided in paragraph (i)(3)(i) of this condition, the 50 hours per calendar year for non- emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

(i) The 50 hours per year for non-emergency situations can be used to supply power as part of a financial arrangement with another entity if all of the following conditions are met:

(A) The engine is dispatched by the local balancing authority or local transmission and distribution system operator;

(B) The dispatch is intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads that could lead to the interruption of power supply in a local area or region.

(C) The dispatch follows reliability, emergency operation or similar protocols that follow specific NERC, regional, state, public utility commission or local standards or guidelines.

(D) The power is provided only to the facility itself or to support the local transmission and distribution system.

(E) The owner or operator identifies and records the entity that dispatches the engine and the specific NERC, regional, state, public utility commission or local standards or guidelines that are being followed for dispatching the engine. The local balancing authority or local transmission and distribution system operator may keep these records on behalf of the engine owner or operator. [40CFR 60.4211(f)]

The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524, if the requirements in conditions f. through i. are not met.

Recordkeeping [15A NCAC 2Q .0508(f)]

j. To assure compliance, the Permittee shall perform inspections and maintenance on the engine as recommended by the manufacturer per 40 CFR 60.4206 and 40 CFR 60.4211(a). The results of inspection and maintenance shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request. The logbook shall record the following:
   i. the date and time of each recorded action;
   ii. the results of each inspection;
   iii. the results of any maintenance performed on the engine;
   iv. any variance from manufacturer's recommendations, if any, and corrections made;
   v. the hours of operation during maintenance and readiness testing, emergency service and non-emergency service [40 CFR60.4214(b)];
   vi. if a PM filter is used, records of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit of the engine is approached [40 CFR60.4214(c)]

   The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524 if these records are not maintained.

   Reporting [15A NCAC 2Q .0508(f)]

k. The Permittee shall submit a summary report of monitoring and recordkeeping activities postmarked on or before January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period between January and June. All instances of noncompliance with the requirements of this permit shall be clearly identified.

l. If the Permittee owns or operates an emergency stationary CI ICE with a maximum engine power more than 100 HP that operates or is contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in conditions (i)(2)(ii) and (iii) or that operates for the purposes specified in condition(i)(3)(i), the Permittee shall submit an annual report according to the requirements at 40 CFR 60.4214(d). This report must be submitted to the Regional Supervisor and the EPA. [40 CFR60.4214(d)]

d. The following PSD evaluation will use the individual project that has the largest criteria pollutant emissions to evaluate this modification against the PSD thresholds. The project in this application with the largest emissions of VOCs and SO_2 was PD00002-3P which involves the installation of a 400 kW (536 hp) Diesel fuel fired emergency generator. Fort Bragg is a PSD major source for criteria pollutants.

The Diesel fuel-fired engine will emit CO, NOx, PM, PM10, PM2.5, SO_2, VOCs, and GHGs. All of the proposed engines will be subject to NSPS Subpart IIII and are therefore required to meet the limitations in this Subpart for CO, NOx, PM10, and VOCs. These factors will be used in this evaluation when appropriate.

Pollutant	Major Source Significance level
GHGs	75,000 tpy
PM	25 tpy
PM10	15 tpy
PM2.5	10 tpy
SO_2	40 tpy
VOCs	40 tpy
CO	100 tpy
NOx	40 tpy

The example calculation was made using the following data:
- Using 500 hour per year maximum operation for emergency generator ES-187GI
- Maximum kW rating = 400 kW (536 hp)

- NOx = 4.0 g/kW-hr (NSPS Subpart IIII, 40 CFR 89.112 emission limit)
- CO = 3.5 g/kW-hr (NSPS Subpart IIII, 40 CFR 89.112 emission limit)
- PM/PM10 = 0.2 g/kW-hr (NSPS Subpart IIII, 40 CFR 89.112 emission limit)
- PM2.5 = 2.20E-03 lbs/hp-hour (DAQ spread sheet)
- SO_2 = 1.21E-03 lbs/hp-hour (DAQ spread sheet)
- VOCs = 2.51E-03 lbs/hp-hour (DAQ spread sheet)

From 40 CFR Part 98, "Mandatory Green House Gas Reporting", Tables C-1 and C-2), Revised 11/29/2013

- Emission factor for No. 2 fuel oil = 73.96 kg CO_2/mmBtu
- Emission factor for No. 2 fuel oil = 3.0E-03 kg CH_4/mmBtu
- Emission factor for No. 2 fuel oil = 6.0E-04 kg N_2O/mmBtu

Globing Warming Potentials from 40 CFR Part 98, A-1 (CO_2 equivalence), Revised 11/29/2013

- CO_2 = 1
- CH_4 = 25
- N_2O = 298

GHGs (CO_2, CH_4, N_2O):
Fort Bragg is a major PSD source for GHG emissions (> 100,000 tpy). The GHG emission factors were taken from 40 CFR Part 98 "Mandatory Greenhouse Gas Reporting", Subpart C, Table C-2 for Petroleum fuel types, revised November 29, 2013. The total GHG emission rate from the PD00002-3P project at Building 519 is less than 75,000 tons per year (at 480 tpy CO_{2e}) threshold. Therefore, no PSD avoidance condition for GHGs is required. *See example calculations below.*

GHGs:
In accordance with EPA's AP-42 Chapter 3.3 (Table 3.3-1; Reference a), an average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr was used to convert from lb/mmBtu to lb/hp-hr when necessary. GHGs (CO_{2e}) are less than the PSD significance level (75,000 tpy)

$$\frac{400\ kW}{engine} \times \frac{1.341\ hp}{1\ kW} \times = \frac{536\ hp}{engine}$$

$$\frac{73.96\ kg\ CO_2}{1\times10^6\ Btu} \times \frac{1000\ g}{kg} \times \frac{1\ lb}{453.59\ g} \times \frac{7000\ Btu}{hp-hr} \times \frac{536\ hp}{1} \times \frac{1\ ton}{2000\ lbs} \times \frac{500\ hrs}{year} \times \frac{1\ tons\ CO_{2e}}{1\ ton\ CO_2} = \frac{153\ tons\ CO_{2e}}{year}$$

$$\frac{3.0E-03\ kg\ CH_4}{1\times10^6\ Btu} \times \frac{1000\ g}{kg} \times \frac{1\ lb}{453.59\ g} \times \frac{7000\ Btu}{hp-hr} \times \frac{536\ hp}{1} \times \frac{1\ ton}{2000\ lbs} \times \frac{500\ hrs}{year} \times \frac{25\ tons\ CO_{2e}}{1\ ton\ CO_2} = \frac{0.16\ tons\ CO_{2e}}{year}$$

$$\frac{6.0E-04\ kg\ N_2O}{1\times10^6\ Btu} \times \frac{1000\ g}{kg} \times \frac{1\ lb}{453.59\ g} \times \frac{7000\ Btu}{hp-hr} \times \frac{536\ hp}{1} \times \frac{1\ ton}{2000\ lbs} \times \frac{500\ hrs}{year} \times \frac{298\ tons\ CO_{2e}}{1\ ton\ CO_2} = \frac{0.37\ tons\ CO_{2e}}{year}$$

Total CO_2e burning No. 2 fuel oil (Diesel fuel) = 153 + 0.16 + 0.37 = 153.5 tons CO_2e per year total.

NOx emissions from project PD00002-3P at Building 512:
NOx emissions (0.89 tpy at 500 hrs/yr) are less than the 40 tpy significance level.

$$\frac{4.0\ g\ NOx}{kW-hr} \times \frac{1\ lbs\ NOx}{453.59\ g} \times \frac{400\ kW}{1} \times \frac{1\ \text{ton NOx}}{2000\ \text{lbs NOx}} \times \frac{500\ \text{hrs}}{\text{year}} = \frac{0.89\ \text{tons NOx}}{\text{year}}$$

PM/PM10 emissions from project PD00002-3P at Building 512:
PM/PM10 emissions (0.04 tpy at 500 hrs/yr) are less than the 25 tpy significance level and PM2.5 emissions (0.097 tpy at 500 hrs/yr) are less than the 15 tpy significance level.

$$\frac{0.20\ g\ PM\ /\ PM10}{kW-hr}\times\frac{1\ lbs\ PM\ /\ PM10}{453.59\ g}\times\frac{400\ kW}{1}\times\frac{1\ \text{ton}\ PM\ /\ PM10}{2000\ \text{lbs}\ PM\ /\ PM10}\times\frac{500\ \text{hrs}}{\text{year}}=\frac{0.04\ \text{tons}\ PM\ /\ PM10}{\text{year}}$$

PM2.5 emissions from project PD00002-3P at Building 512:
PM2.5 emissions (0.097 tpy at 500 hrs/yr) are less than the 10 tpy significance level.

$$\frac{2.20E-04\ lbs\ PM\ 2.5}{hp-hr}\times 536\ hp\times\frac{1\ \text{ton}\ PM\ 2.5}{2000\ \text{lbs}\ PM\ 2.5}\times\frac{500\ \text{hrs}}{\text{year}}=\frac{0.03\ \text{tons}\ PM\ 2.5}{\text{year}}$$

SO_2 emissions from project PD00002-3P at Building 512:
NSPS Subpart IIII does not have an emission limit for SO, but it does require that all Diesel fuel fired in the engines contain less than 0.15% by weight sulfur. The DAQ spreadsheet uses 0.15% sulfur by weight in its calculations. SO_2 emissions (0.16 tpy at 500 hrs/yr) are less than the 40 tpy significance level.

$$\left[\frac{1.21\text{E-}03\ lbs\ SO_2}{\text{hp-hour}}\times 536\ hp\times\right]\times\frac{1\ \text{ton}}{2000\ \text{lbs}}\times\frac{500\ \text{hrs}}{\text{year}}=\frac{0.16\ \text{tons}\ SO_2}{\text{year}}$$

CO emissions from project PD00002-3P at Building 512:
CO emissions (0.77 tpy at 500 hrs/yr) are less than the 100 tpy significance level.

$$\frac{3.5\ g\ CO}{kW-hr}\times\frac{1\ lbs\ CO}{453.59\ g}\times\frac{400\ kW}{1}\times\frac{1\ \text{ton}\ CO}{2000\ lbs\ CO}\times\frac{500\ \text{hrs}}{\text{year}}=\frac{0.77\ \text{tons}\ CO}{\text{year}}$$

VOCs emissions from project PD00002-3P at Building 512:
NSPS Subpart IIII does not have a separate emission limit for VOCs for this model year generator. The VOC emission factor used is from DAQ spread sheet (less than 600 hp). VOC emissions (0.34 tpy at 500 hrs/yr) are less than the 40 tpy significance level.

$$\frac{2.51E-03\ lbs\ VOC}{hp-hr}\times\frac{536\ hp}{1}\times\frac{1\ \text{ton}\ VOC}{2000\ \text{lbs}\ VOC}\times\frac{500\ \text{hrs}}{\text{year}}=\frac{0.34\ \text{tons}\ VOC}{\text{year}}$$

Summary table for emissions from largest project for indirect-fired combustion sources

Pollutant	NOx	VOCs	PM	PM10	PM2.5	GHGs	SO_2	CO
Value	0.89 tpy	0.34 tpy	0.04 tpy	0.04 tpy	0.03 tpy	153.5 tpy	0.16 tpy	0.77 tpy
PSD Threshold	40 tpy	40 tpy	25 tpy	15 tpy	10 tpy	75,000 tpy (CO_{2e})	40 tpy	100 tpy

B. Boilers, and indirect-fired hot water heaters listed in Table 2 of this review.
The heat input from all of the applicable units will be reviewed in accordance with 15A NCAC 2D .0503 because the NSPS does not have a particulate emission standard for boilers that are less than 10 million Btu per hour heat input.

1. Description: All of the boilers and hot water heaters at Fort Bragg are used for domestic purposes only and not to heat water for a production process. Historically the Division of Air Quality has permitted comfort heat boilers at military bases and universities because of the size and the large number of boilers. The units at military bases are usually funded separately under a variety of projects and are therefore evaluated by the separately funded projects. The boilers and water heaters are subject to the Boiler MACT and will be listed in the body of the permit.

2. Applicable Regulatory Requirements: The small boilers in this modification are placed into the body of the permit because they are subject to the boiler MACT. These are new boilers, but NSPS Subpart Dc does not apply because each of the units is less than 10 million Btu per hour heat input. These boilers will be evaluated for toxic air pollutants in accordance with G.S. 143-215.107(a) and 15A NCAC 2Q .0711(a)(27).

   Boilers and process heaters in the units designed to burn gas 1 fuels (natural gas which also includes liquefied petroleum gas) subcategory with a heat input capacity of less than or equal to 5 million Btu per hour must complete a tune-up every 5 years as specified in §63.7540.

   Boilers and/or process heaters in the units designed to burn gas 1 fuels subcategory are not subject to the emission limits in Tables 1 and 2 or 11 through 13 to this subpart, or the operating limits in Table 4 to this subpart [40 CFR 63.7500(e)]. This regulation does not apply to hot water heaters that are heated by gaseous or liquid fuel with a capacity of no more than 120 US gallon capacity.

   Boilers and/or process heaters designed to burn fuel in the light liquid subcategories (including No. 2 fuel oil) must conduct a tune-up of the boiler or process heater every 5 years as specified in paragraphs (a)(10)(i) through (vi) of 40 CFR §63.7540 to demonstrate continuous compliance. The Permittee may delay the burner inspection specified in paragraph (a)(10)(i) of this section until the next scheduled or unscheduled unit shutdown, but must inspect each burner at least once every 72 months.

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Particulate matter	0.18 lbs per million Btu heat input	15A NCAC 2D .0503
Sulfur dioxide	2.3 pounds per million Btu heat input	15A NCAC 2D .0516
Visible emissions	20 percent opacity	15A NCAC 2D .0521
Toxic air pollutants	Evaluation required by the DAQ	15A NCAC 2Q .0711(a)(27) G.S. 143-215.107
HAPS	Work practice standards	15A NCAC 2D .1111 Subpart DDDDD

Because these boilers are not subject to NSPS Subpart Dc (heat inputs less than 10 million Btu per hour), particulate emission rates will have allowable emission rates in accordance with 15A NCAC 2D .0503 (e). Per this regulation, the maximum heat input shall be the total heat content of all fuels that are burned in a fuel burning indirect heat exchanger, of which the combustion products are emitted through a stack or stacks. The sum of maximum heat input of all fuel burning indirect heat exchangers at a plant site that are in operation, under construction, or permitted pursuant to 15A NCAC 2Q, shall be considered as the total heat input for the purpose of determining the allowable emission limit for particulate matter for each fuel burning indirect heat exchanger.

Fuel burning indirect heat exchangers constructed or permitted after February 1, 1983, shall not change the allowable emission limit of any fuel burning indirect heat exchanger whose allowable emission limit has previously been set.

The removal of a fuel burning indirect heat exchanger shall not change the allowable emission limit of any fuel burning indirect heat exchanger whose allowable emission limit has previously been established. However, for any fuel burning indirect heat exchanger constructed after, or in conjunction with, the removal of another fuel burning indirect heat exchanger at the plant site, the maximum heat input of the removed fuel burning indirect heat exchanger shall no longer be considered in the determination of the allowable emission limit of any fuel burning indirect heat exchanger constructed after or in conjunction with the removal.

a. 15A NCAC 2D .0503: PARTICULATES FROM FUEL BURNING INDIRECT HEAT EXCHANGERS

i. Emissions of particulate matter from the combustion of natural gas that are discharged from these sources into the atmosphere shall not exceed 0.18 pounds per million Btu heat input. [15A NCAC 2D .0503(a)]

Table 2 Heat input values for boilers currently permitted at Fort Bragg and the new boilers per application (2600102.14A):

ID No.	Heat input (mmBtu/hr)	Type of fuel	Description	Project
Boilers, and water h currently at facility	1050.75 mmBtu/hr heat ir total at the facility as of re T39	Natural gas, No. 2 fuel oil, recycled No. 2 fuel oil, Die fuel	Various combustion devices	----------
ES-787B	0.60 mmBtu per hour	Natural gas	Boiler	PN69624
ES-788B	0.40 mmBtu per hour	Natural gas	Boiler	SC00017-3P
ES-789B	0.45 mmBtu per hour	Natural gas	Boiler	
ES-790B	0.36 mmBtu per hour	Natural gas	Boiler	
ES-791B	1.50 mmBtu per hour	Natural gas	Boiler	PN69287
ES-792B	1.50 mmBtu per hour	Natural gas	Boiler	
ES-793B	1.35 mmBtu per hour	Natural gas	Hot water heater	
ES-794B	1.35 mmBtu per hour	Natural gas	Hot water heater	
ES-795B	0.40 mmBtu per hour	Natural gas	Boiler	PN69458
ES-796B	0.40 mmBtu per hour	Natural gas	Boiler	
ES-797B	0.80 mmBtu per hour	Natural gas	Hot water heater	
ES-798B	0.80 mmBtu per hour	Natural gas	Hot water heater	
ES-799B	0.5 mmBtu per hour	Natural gas	Boiler	PN71224
ES-800B	0.5 mmBtu per hour	Natural gas	Boiler	
ES-801B	0.3 mmBtu per hour	Natural gas	Hot water heater	PN64340
ES-802B	1.3 mmBtu per hour	Natural gas	Boiler	FA42003-1
ES-803B	1.3 mmBtu per hour	Natural gas	Boiler	
ES-804B	1.3 mmBtu per hour	Natural gas	Boiler	
ES-805B	1.08 mmBtu per hour	Natural gas	Boiler	FA41006-9P
ES-806B	1.0 mmBtu per hour	Natural gas	Hot water heater	FA41004-9P
ES-807B	1.57 mmBtu per hour	Natural gas	Boiler	
ES-808B	1.57 mmBtu per hour	Natural gas	Boiler	
ES-809B	0.4 mmBtu per hour	Natural gas	Boiler	FZ40021-1P
ES-810B	0.9 mmBtu per hour	Natural gas	Boiler	FA41007-9P
ES-811B	0.9 mmBtu per hour	Natural gas	Boiler	FA41005-9P
ES-812B	0.5 mmBtu per hour	Natural gas	Boiler	PN75079
ES-813B	0.5 mmBtu per hour	Natural gas	Boiler	FA42401-0P
ES-814B	1.8 mmBtu per hour	Natural gas	Boiler	FA40204-9P
ES-815B	0.65 mmBtu per hour	Natural gas	Boiler	
ES-816B	1.43 mmBtu per hour	Natural gas	Hot water heater	SB00271-8P
ES-817B	0.4 mmBtu per hour	Natural gas	Boiler	PN69798
ES-818B	0.4 mmBtu per hour	Natural gas	Boiler	
ES-819B	2.0 mmBtu per hour	Natural gas	Boiler	
ES-820B	2.0 mmBtu per hour	Natural gas	Boiler	
ES-821B	0.75 mmBtu per hour	Natural gas	Boiler	FA42404-0P
ES-822B	0.5 mmBtu per hour	Natural gas	Boiler	SB00067-3P
ES-823B	0.5 mmBtu per hour	Natural gas	Boiler	SB00068-3P
ES-824B	1.0 mmBtu per hour	Natural gas	Boiler	TA00048-5P
ES-825B	3.0 mmBtu per hour	Natural gas	Hot water heater	BRAC
ES-826B	1.05 mmBtu per hour	No. 2 fuel oil	Boiler	SC00007-2P
ES-827B	0.4 mmBtu per hour	No. 2 fuel oil/natural gas	Hot water heater	PN69275
ES-828B	0.64 mmBtu per hour	No. 2 fuel oil/natural gas	Boiler	PN60743
ES-829B	0.64 mmBtu per hour	No. 2 fuel oil/natural gas	Boiler	
Total for this modification: 40.69 mmBtu per hour				
Total for Facility: 1050.75 + 40.69 = 1091.44 mmBtu per hour				

$E = 1.090 \times Q^{-0.2594}$ Where: E = allowable PM emission rate in lbs/mmBtu heat input
Q = maximum heat input rate in million Btu per hour

$E = 1.090 \times Q^{-0.2594}$
$E = 1.090 \times (1091.44)^{-0.2594}$
$E_{allow} = 0.18$ pounds PM per million Btu heat input

The particulate matter emission rate from the burning of natural gas and/or No. 2 fuel oil in any boiler was estimated using AP-42 factors, Supplement E, revised 9/98.

- Heating value natural gas = 1020 Btu per cubic foot
- Heating value No. 2 fuel oil = 141,000 Btu per gallon

$$\frac{7.6\ lbs PM}{10^6\ cubic\ feet} \times \frac{1\ cubic\ foot\ natural gas}{1020\ Btu} \times \frac{10^6\ Btu}{million Btu} = \frac{0.0074\ lbs PM}{million Btu}$$

$$\frac{2.38 lbs PM}{10^3\ gallons No.2\ fuel\ oil} \times \frac{1\ gallon No.2\ fuel\ oil}{141{,}000\ Btu} \times \frac{10^6\ Btu}{million Btu} = \frac{0.017\ lbs PM}{million Btu}$$

Compliance is indicated when any of the boilers and hot water heaters burn natural gas or No. 2 fuel oil, since the actual emission rate of each is less than the allowable emission rate (0.18 lbs PM per million Btu heat input).

Testing [15A NCAC 2D .0501(c)(3)]

ii. If emission testing is required, the testing shall be performed in accordance General Condition JJ located in Section 3 of the Air Permit. If the results of this test are above the limit given above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0503.

Monitoring [15A NCAC 2Q .0508(f)]

iii. No monitoring, recordkeeping, or reporting is required for particulate emissions from the firing of natural gas or No. 2 fuel oil in any boiler or hot water heater.

b. 15A NCAC 2D .0516: SULFUR DIOXIDE EMISSIONS FROM COMBUSTION SOURCES

i. Emissions of sulfur dioxide from these sources shall not exceed 2.3 pounds per million Btu heat input. Sulfur dioxide formed by the combustion of sulfur in fuels, wastes, ores, and other substances shall be included when determining compliance with this standard. [15A NCAC 02D .0516]

AP-42 emission factor for natural gas = 0.6 lbs SO_2/mmcf
AP-42 emission factor for No. 2 fuel oil with (0.5% by weight S) = 71 lbs SO_2/1000 gallons

$$\frac{0.6\ lbs\ SO_2}{10^6\ cubic\ feet\ natural\ gas} \times \frac{1\ cubic\ foot\ natural\ gas}{1020\ Btu} \times \frac{10^6\ Btu}{million\ Btu} = 0.00058\ \frac{lbs\ PM}{million\ Btu}$$

$$\frac{71.0\ lbs\ SO_2}{10^3\ gallons\ No.2\ fuel\ oil} \times \frac{1\ gallon\ No.2\ fuel\ oil}{141{,}000\ Btu} \times \frac{10^6\ Btu}{million\ Btu} = \frac{0.5\ lbs\ SO_2}{million\ Btu}$$

Compliance is indicated when any boiler and hot water heater burns natural gas or No. 2 fuel oil since the actual emission rate of each is less than the allowable emission rate (2.3 lbs SO_2 per million Btu heat input).

Testing [15A NCAC 2D .2601]

ii. If emission testing is required, the testing shall be performed in accordance with 15A NCAC 2D .2601 and General Condition JJ found in Section 3 of the Permit. If the results of this test are above the limit given above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0516.

Monitoring/Recordkeeping [15A NCAC 2Q .0508(f) and 15A NCAC 2D .2601]

iii. No monitoring, recordkeeping, or reporting is required for sulfur dioxide emissions from the firing of natural gas or No. 2 fuel oil in any boiler or hot water heater.

c. 15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS

i. Visible emissions from any of the natural gas-fired, or No. 2 fuel oil fired units shall not be more than 20 percent opacity when averaged over a six-minute period. However, six-minute averaging periods may exceed 20 percent not more than once in any hour and not more than four times in any 24-hour period. In no event shall the six-minute average exceed 87 percent opacity. [15A NCAC 02D .0521 (d)]

Testing [15A NCAC 02D .2601]

ii. If emission testing is required, the testing shall be performed in accordance with 15A NCAC 2D .2601 and General Condition JJ. If the results of this test are above the limit given above, the Permittee shall be deemed in noncompliance with 15A NCAC 02D .0521.

iii. Monitoring/Recordkeeping/Reporting [15A NCAC 02Q .0508(f)]
No monitoring, recordkeeping, or reporting is required for visible emissions from the firing of natural gas, or No. 2 fuel oil in any boiler or water heater.

d. PSD Evaluation for the boilers in application 2600102.14A:
Due to the operational tempo and structure of this military facility, projects are frequently initiated and funded separately by various different tenants who all fall under the ownership of Fort Brag Army Post. These projects are appropriated separately by Congress, the emissions are calculated separately for each funding code, and evaluated independently against the PSD major modification thresholds.

In this application the project with the largest criteria pollutant emissions for NOx, PM, PM10, PM2.5 GHGs, and CO was PN69287 to be located at 3rd SFG BOF at Old ASP. The combined heat input (5.7 mmBtu per hour) for the four boilers/hot water heaters (ES-791B through 794B) firing natural gas was used in the following calculations. The DAQ spread sheet http://www.daq.state.nc.us/permits/spreadsheets/, Revision L, 8/9/2013 was used.

Total heat input = 5.7 mmBtu per hour
Fuel = natural gas
Uncontrolled

Pollutant	NOx	VOCs	PM	PM10	PM2.5	GHGs	SO_2	CO
Value	2.45 tpy	0.13 tpy	0.19 tpy	0.05 tpy	0.14 tpy	2,921 tpy	0.01 tpy	2.06 tpy
PSD Threshold	40 tpy	40 tpy	25 tpy	15 tpy	10 tpy	75,000 tpy (CO_{2e})	40 tpy	100 tpy

The PSD threshold is not exceeded for any criteria pollutant.

VII. The application was signed by an authorized official as defined by 15A NCAC 2Q .0304(j).

VIII. An air toxics review and evaluation is triggered with the addition of the combustion sources (boilers, hot water heaters, and engines).

General Statute G.S. 143-215.107(a) was approved on June 28, 2012 and this Act exempts from State Air Toxics those sources of emissions that are subject to certain Federal emissions requirements under 40 CFR Part 61 (NESHAP), Part 63 (NESHAP), or Case-by-Case MACT pursuant to 42 U.S.C. §7412(j). This statute was placed into the North Carolina State Air Toxics regulations on May 1, 2014 under Regulation 15A NCAC 2Q .0702(a)(27).

North Carolina Division of Air Quality's air toxics program is a "risk-based" regulatory program designed to protect the public health by limiting emissions of toxic air pollutants from man-made sources. The Fort Bragg military base submitted a facility-wide toxics demonstration on December 29, 2011. The model did demonstrate compliance on a source-by-source basis with the AAL.

This facility is modeled as five separate zones, each acting as an independent facility {five zones (A through E)}. As a conservative approach, the facility modeled all pollutants that were greater than 50% of their respective TPER limits. Fort Bragg used AERMOD with regulatory defaults, and with five years of DAQ processed meteorology (Raleigh, 1988-1992) to model the emissions. Adequate receptors were incorporated, along with digital elevation data, to determine maximum impacts, which occurred on or near the property lines. Based on the dispersion modeling results, the model submitted in applications 2600102.12A and 12C did demonstrate compliance on a source by source basis with the AAL. The Permit for applications 2600102.12A and 12C was issued as Revision T37. Since the issuance of Revision T37, two other permit revisions were issued (T38 and T39) that added or removed small indirect-fired combustion sources, emergency generators and other miscellaneous sources.

The following tables list the total increases in Zones A through D that have occurred since the last facility wide modeling exercise was performed.

Summary of Zone A toxic air pollutant emissions (Table 1):

Compound	Modeled Emission Rates	Increase per T39 lbs/hr	Increase per T39 lbs/day	Increase per T39 lbs/yr	Increase per T40 lbs/hr	Increase per T40 lbs/day	Increase per T40 lbs/yr	Total increase in emissions
1,3-Butadiene	14.64 lbs/yr	---	---	0.01	---	---	0.10	0.11 lbs/yr
Acetic acid	11.40 lbs/hr	---	---	---	---	---	---	---
Acrolein	0.01 lbs/hr	---	---	---	0.0	---	---	---
Acrylonitrile	0.24 lbs/day	---	---	---	---	---	---	---
Ammonia	11.87 lbs/hr	---	---	---	---	---	---	---
Arsenic	32.56 lbs/yr	---	---	0.09	---	---	0.17	0.26 lbs/yr
Benzene	670.76 lbs/yr	---	---	9.48	---	---	3.08	12.56 lbs/yr
Beryllium	19.30 lbs/yr	---	---	0.05	---	---	0.08	0.13 lbs/yr
Cadmium	29.96 lbs/yr	---	---	0.20	---	---	0.43	0.63 lbs/yr
Chloroform	256.78 lbs/yr	---	---	---	---	---	---	---
Non specific Chromium VI	10.24 lbs/yr	---	---	---	---	---	---	---
Cresol	1.85 lbs/hr	---	---	---	0.0	---	---	---
Ethylenediamine	11.40 lbs/hr	---	---	---	---	---	---	---
	38.00 lbs/day	---	---	---	---	---	---	---
Di(2-Ethylhexyl) Phthalate	38.00 lbs/day	---	---	---	---	---	---	---
Formaldehyde	0.55 lbs/hr	---	---	---	0.004	---	---	0.004 lbs/hr
Hydrogen chloride	1.81 lbs/hr	---	---	---	---	---	---	---
Hydrogen sulfide	393.25 lbs/day	---	---	---	---	---	---	---
n-Hexane	106.43 lbs/day	---	0.68	---	---	1.64	---	2.32 lbs/day
Manganese	12.96 lbs/day	---	0.0	---	---	0.0	---	---
Methylene chloride	11.44 lbs/hr	---	---	---	0.0	---	---	---
	7442.09 lbs/yr	---	---	---	---	---	---	---
Methyl ethyl ketone	30.80 lbs/hr	---	---	---	---	---	---	---
	103.01 lbs/day	---	---	---	---	---	---	---
Methyl isobutyl ketone	37.63 lbs/hr	---	---	---	---	---	3.08	3.08 lbs/yr
	125.53 lbs/day	---	---	---	---	---	---	---
Mercury	0.14 lbs/day	---	0.0	---	---	0.0	---	---

Nickel	1.12 lbs/day	---------	0.0	---------	---------	0.002	---------	0.002 lbs/day
Perchloroethylene	7286.48 lbs/yr	---------	---------	---------	---------	---------	---------	---------
Phenol	20.09 1bs/hr	---------	---------	---------	---------	---------	---------	---------
Styrene	11.78 lbs/hr	---------	---------	---------	---------	---------	---------	---------
Toluene	121.20 lbs/hr	0.01 lbs/hr	---------	---------	---------	0.0	---------	---------
	415.01 lbs/day	---------	0.16 lbs/day	0.0	0.0	0.009	---------	0.009 lbs/day
Vinyl chloride	119.76 lbs/yr	--------	---------	---------	---------	---------	---------	---------
Xylene	89.11 lbs/hr	---------	---------	---------	---------	---------	---------	---------
	301.54 lbs/day	---------	0.11 lbs/day	0.0	---------	0.002	0.0	0.112 lbs/day

Summary of Zone A toxic air pollutant emissions (Table 2):

Compound	Modeled Emission Rates	Modeled Percentage (lbs/hr)	Modeled Percentage (lbs/day)	Modeled Percentage (lbs/yr)
1,3-Butadiene	14.64 lbs/yr	---------	---------	0.01%
Acetic acid	11.40 lbs/hr	3.26%	---------	---------
Acrolein	0.01 lbs/hr	0.20%	---------	---------
Acrylonitrile	0.24 lbs/day	---------	0.01%	---------
Ammonia	11.87 lbs/hr	4.47%	---------	---------
Arsenic	32.56 lbs/yr	---------	---------	---------
Benzene	670.76 lbs/yr	---------	---------	2.52%
Beryllium	19.30 lbs/yr	---------	---------	1.12%
Cadmium	29.96 lbs/yr	---------	---------	1.28%
Chloroform	256.78 lbs/yr	---------	---------	0.58%
Non specific Chromium VI	10.24 lbs/yr	---------	---------	41.64%
Cresol	1.85 lbs/hr	2.82%	---------	---------
Ethylenediamine	11.40 lbs/hr	4.83%	---------	---------
	38.00 lbs/day	---------	0.49%	---------
Di(2-Ethylhexyl) Phthalate	38.00 lbs/day	---------	4.93%	---------
Formaldehyde	0.55 lbs/hr	0.54%	---------	---------
Hydrogen chloride	1.81 lbs/hr	8.56%	---------	---------
Hydrogen sulfide	393.25 lbs/day	---------	67.76%	---------
n-Hexane	106.43 lbs/day	---------	0.14%	---------
Manganese	12.96 lbs/day	---------	1.07%	---------
Methylene chloride	11.44 lbs/hr	7.10%	---------	---------
	7442.09 lbs/yr	---------	---------	0.09%
Methyl ethyl ketone	30.80 lbs/hr	0.37%	---------	---------
	103.01 lbs/day	---------	0.11%	---------
Methyl isobutyl ketone	37.63 lbs/hr	1.33%	---------	---------
	125.53 lbs/day	---------	0.19%	---------
Mercury	0.14 lbs/day	---------	0.76%	---------
Nickel	1.12 lbs/day	---------	0.41%	---------
Perchloroethylene	7286.48 lbs/yr	---------	---------	0.01%
Phenol	20.09 1bs/hr	20.32%	---------	---------
Styrene	11.78 lbs/hr	1.14%	---------	---------
Toluene	121.20 lbs/hr	2.15%	---------	---------
	415.01 lbs/day	---------	0.31%	---------
Vinyl chloride	119.76 lbs/yr	---------	---------	0.07%
Xylene	89.11 lbs/hr	1.39%	---------	---------
	301.54 lbs/day	--------	0.41%	---------

As noted in Tables 1 and 2 above, the increase in each TAP's emission rate since the previous modeling demonstration, is a small percentage of each of the original individual pollutant's modeled emission rates in Zone A. Since the original modeled emission rates resulted in ambient impacts well below each TAPs respective AAL, it is reasonable to conclude that the increases in emissions associated with each of the

projects since the last modeling demonstration would not result in an increase in ambient impacts to the degree that the each TAPs respective AAL would be exceeded in Zone A.

Therefore, the DAQ has concluded that the addition of the proposed sources in revisions T38 through T40 will not present an unacceptable risk to human health in Zone A.

Summary of Zone B toxic air pollutant emissions (Table 1):

Compound	Modeled Emission Rates	Increase per T39 (lbs/hr)	Increase per T39 (lbs/day)	Increase per T39 (lbs/yr)	Increase per T40 (lbs/hr)	Increase per T40 (lbs/day)	Increase per T40 (lbs/yr)
Acetic acid	8.55 lbs/hr	----------	----------	----------	----------	----------	----------
Ammonia	8.55 lbs/hr	----------	----------	----------	----------	----------	----------
Arsenic	2.26 lbs/yr	----------	----------	----------	----------	----------	----------
Benzene	5.24 lbs/yr	----------	----------	----------	----------	----------	----------
Beryllium	1.63 lbs/yr	----------	----------	----------	----------	----------	----------
Cadmium	2.18 lbs/yr	----------	----------	----------	----------	----------	----------
Non Specific Chromium VI	2.43 lbs/yr	----------	----------	----------	----------	----------	----------
Bio available Chromium VI	1.16 lbs/yr	----------	----------	----------	----------	----------	----------
Soluble Chromate Compounds	0.06 lbs/day	----------	----------	----------	----------	----------	----------
Ethylenediamine	8.55 lbs/hr	----------	----------	----------	----------	----------	----------
	28.50 lbs/day	----------	----------	----------	----------	----------	----------
Di(2-Ethylhexyl) Phthalate	28.50 lbs/day	----------	----------	----------	----------	----------	----------
Formaldehyde	0.04 lbs/hr	----------	----------	----------	----------	----------	----------
n-Hexane	33.07 lbs/day	----------	----------	----------	----------	----------	----------
Manganese	4.29 lbs/day	----------	----------	----------	----------	----------	----------
Methylene chloride	8.55 lbs/hr	----------	----------	----------	----------	----------	----------
	7125.0 lbs/yr	----------	----------	----------	----------	----------	----------
Methyl ethyl ketone	23.09 lbs/hr	----------	----------	----------	----------	----------	----------
	76.95 lbs/day	----------	----------	----------	----------	----------	----------
Methyl isobutyl ketone	28.22 lbs/hr	----------	----------	----------	----------	----------	----------
	94.05 lbs/day	----------	----------	----------	----------	----------	----------
Nickel	0.42 lbs/day	----------	----------	----------	----------	----------	----------
Perchloroethylene	7125 lbs/yr	----------	----------	----------	----------	----------	----------
Phenol	13.68 lbs/hr	----------	----------	----------	----------	----------	----------
Styrene	8.55 lbs/hr	----------	----------	----------	----------	----------	----------
Toluene	85.51 lbs/hr	----------	----------	----------	----------	----------	----------
	285.11 lbs/day	----------	----------	----------	----------	----------	----------
Xylene	64.13 lbs/hr	----------	----------	----------	----------	----------	----------
	213.78 lbs/day	----------	----------	----------	----------	----------	----------

Summary of Zone B toxic air pollutant emissions (Table 2):

Compound	Modeled Emission Rates	Modeled Percenta (lbs/hr)	Modeled Percentage (lbs/day)	Modeled Percentage (lbs/yr)
Acetic acid	8.55 lbs/hr	7.13%	----------	----------
Ammonia	8.55 lbs/hr	9.78%	----------	----------
Arsenic	2.26 lbs/yr	----------	----------	----------
Benzene	5.24 lbs/yr	----------	----------	0.15%
Beryllium	1.63 lbs/yr	----------	----------	0.17%
Cadmium	2.18 lbs/yr	----------	----------	0.20%
Non Specific Chromium VI	2.43 lbs/yr	----------	----------	95.20%

Bio available Chromium VI	1.16 lbs/yr	----------	----------	34.58%
Soluble Chromate Compounds	0.06 lbs/day	----------	1.22%	----------
Ethylenediamine	8.55 lbs/hr	10.56%	1.26%	----------
	28.50 lbs/day	----------	----------	----------

Summary of Zone B toxic air pollutant emissions (Table 2): - continued-

Compound	Modeled Emission Rates	Modeled Percentage (lbs/hr)	Modeled Percentage (lbs/day)	Modeled Percentage (lbs/yr)
Di(2-Ethylhexyl) Phthalate	28.50 lbs/day	----------	12.56%	----------
Formaldehyde	0.04 lbs/hr	0.44%	----------	----------
n-Hexane	33.07 lbs/day	----------	0.35%	----------
Manganese	4.29 lbs/day	----------	1.93%	----------
Methylene chloride	8.55 lbs/hr	15.53%	----------	0.74%
	7125.0 lbs/yr	----------	----------	----------
Methyl ethyl ketone	23.09 lbs/hr	0.81%	0.28%	----------
	76.95 lbs/day	----------	---------	----------
Methyl isobutyl ketone	28.22 lbs/hr	2.90%	0.49%	----------
	94.05 lbs/day	----------	----------	----------
Nickel	0.42 lbs/day	----------	0.65%	----------
Perchloroethylene	7125 lbs/yr	----------	----------	0.09%
Phenol	13.68 lbs/hr	44.45%	----------	----------
Styrene	8.55 lbs/hr	2.44%	----------	----------
Toluene	85.51 lbs/hr	4.71%	0.80%	----------
	285.11 lbs/day	----------	---------	----------
Xylene	64.13 lbs/hr	3.05%	1.05%	----------
	213.78 lbs/day	----------	---------	----------

As noted in Tables 1 and 2 above, the increase in each TAP's emission rate since the previous modeling demonstration, is zero in Zone B. Since the original modeled emission rates resulted in ambient impacts well below each TAPs respective AAL, it is reasonable to conclude that the increases in emissions associated with each of the projects since the last modeling demonstration would not result in an increase in ambient impacts to the degree that the each TAPs respective AAL would be exceeded in Zone B.

Therefore, the DAQ has concluded that the addition of the proposed sources in revisions T38 through T40 will not present an unacceptable risk to human health in Zone B.

Summary of Zone C toxic air pollutant emissions (Table 1):

Compound	Modeled Emission Rates	Increase per T39 lbs/hr	Increase per T39 lbs/day	Increase per T39 lbs/yr	Increase per T40 lbs/hr	Increase per T40 lbs/day	Increase per T40 lbs/yr	Total increase in emissions
1,3-Butadiene	46.84 lbs/yr	----------	----------	----------	----------	----------	----------	----------
Acetic acid	3.39 lbs/hr	----------	----------	----------	----------	----------	----------	----------
Acetaldehyde	----------	----------	----------	----------	----------	----------	----------	----------
Acrolein	0.12 lbs/hr	----------	----------	----------	----------	----------	----------	----------
Acrylonitrile	----------	----------	----------	----------	----------	----------	----------	----------
Ammonia	5.70 lbs/hr	----------	----------	----------	----------	----------	----------	----------
Arsenic	9.94 lbs/yr	----------	----------	----------	----------	----------	----------	----------
Benzene	52.05 lbs/yr	----------	----------	----------	----------	----------	----------	----------
Benzo(A)Pyrene	----------	----------	----------	----------	----------	----------	----------	----------
Beryllium	----------	----------	----------	----------	----------	----------	----------	----------
Cadmium	1.14 lbs/yr	----------	----------	----------	----------	----------	----------	----------

Summary of Zone C toxic air pollutant emissions (Table 1): -continued-

Compound	Modeled Emission Rates	Increase per T39 lbs/hr	Increase per T39 lbs/day	Increase per T39 lbs/yr	Increase per T40 lbs/hr	Increase per T40 lbs/day	Increase per T40 lbs/yr	Total increase in emissions
Chloroform	----------	----------	----------	----------	----------	----------	----------	----------
Non Specific Chromium VI	1.72 lbs/yr	----------	----------	----------	----------	----------	----------	----------
Bio available Chromium VI	1.54 lbs/yr	----------	----------	0.05	----------	----------	----------	0.05 lbs/yr
Soluble Chromate Compounds	0.04 lbs/day	----------	----------	----------	----------	----------	----------	----------
Cresol	----------	----------	----------	----------	----------	----------	----------	----------
Ethylenediamine	3.39 lbs/hr	----------	----------	----------	----------	----------	----------	----------
	11.31 lbs/day	----------	----------	----------	----------	----------	----------	----------
Di(2-Ethylhexyl) Phthalate	11.31 lbs/day	----------	----------	----------	----------	----------	----------	----------
Formaldehyde	0.8 lbs/hr	----------	----------	----------	----------	----------	----------	----------
Hydrogen chloride	----------	----------	----------	----------	----------	----------	----------	----------
Hydrogen sulfide	----------	----------	----------	----------	----------	----------	----------	----------
n-Hexane	12.31 lbs/day	----------	----------	----------	----------	----------	----------	----------
Manganese	1.11 lbs/day	----------	----------	----------	----------	----------	----------	----------
Methylene chloride	5.70 lbs/hr	----------	----------	----------	----------	----------	----------	----------
	4750.00 lbs/yr	----------	----------	----------	----------	----------	----------	----------
Methyl ethyl ketone	9.16 lbs/hr	----------	----------	----------	----------	----------	----------	----------
	30.52 lbs/day	----------	----------	----------	----------	----------	----------	----------
Methyl isobutyl ketone	11.19 lbs/hr	----------	----------	----------	----------	----------	----------	----------
	37.31 lbs/day	----------	----------	----------	----------	----------	----------	----------
Methyl Chloroform	----------	----------	----------	----------	----------	----------	----------	----------
Mercury	----------	----------	----------	----------	----------	----------	----------	----------
Nickel	0.16 lbs/day	----------	----------	----------	----------	----------	----------	----------
Perchloroethylene	----------	----------	----------	----------	----------	----------	----------	----------
Phenol	5.44 lbs/hr	----------	----------	----------	----------	----------	----------	----------
Styrene	3.41 lbs/hr	----------	----------	----------	----------	----------	----------	----------
Toluene	33.94 lbs/hr	----------	----------	0.04	----------	----------	----------	0.04 lbs/hr
	113.28 lbs/day	----------	----------	0.35	----------	----------	----------	0.35 lbs/day
Vinyl chloride	----------	----------	----------	----------	----------	----------	----------	----------
Xylene	25.46 lbs/hr	----------	----------	----------	----------	----------	----------	----------
	84.99 lbs/day	----------	----------	----------	----------	----------	----------	----------

Summary of Zone C toxic air pollutant emissions (Table 2):

Compound	Modeled Emission Rates	Modeled Percentage (lbs/hr)	Modeled Percentage (lbs/day)	Modeled Percentage (lbs/yr)
1,3-Butadiene	46.84 lbs/yr	---------	----------	1.54%
Acetic acid	3.39 lbs/hr	3.01%	----------	----------
Acetaldehyde	----------	---------	----------	----------
Acrolein	0.12 lbs/hr	27.86%	----------	----------
Acrylonitrile	----------	----------	----------	----------
Ammonia	5.70 lbs/hr	8.86%	----------	----------
Arsenic	9.94 lbs/yr	----------	----------	----------
Benzene	52.05 lbs/yr	----------	----------	6.21%
Benzo(A)Pyrene	----------	----------	----------	----------
Beryllium	----------	----------	----------	----------
Cadmium	1.14 lbs/yr	----------	----------	2.53%

Summary of Zone C toxic air pollutant emissions (Table 2): -continued-

Compound	Modeled Emission	Modeled Percentage	Modeled Percentage	Modeled Percentage

	Rates	(lbs/hr)	(lbs/day)	(lbs/yr)
Chloroform	----------	----------	----------	----------
Non Specific Chromium VI	1.72 lbs/yr	----------	----------	30.65%
Bio available Chromium VI	1.54 lbs/yr	----------	----------	24.81%
Soluble Chromate Compounds	0.04 lbs/day	----------	0.65%	----------
Cresol	----------	----------	---------	----------
Ethylenediamine	3.39 lbs/hr	----------	0.28%	----------
	11.31 lbs/day	----------	---------	----------
Di(2-Ethylhexyl) Phthalate	11.31 lbs/day	----------	2.81%	----------
Formaldehyde	0.8 lbs/hr	98.54%	----------	----------
Hydrogen chloride	----------	----------	----------	----------
Hydrogen sulfide	----------	----------	----------	----------
n-Hexane	12.31 lbs/day	----------	0.08%	----------
Manganese	1.11 lbs/day	----------	0.59%	----------
Methylene chloride	5.70 lbs/hr	14.07%	----------	0.26%
	4750.00 lbs/yr	----------	----------	----------
Methyl ethyl ketone	9.16 lbs/hr	----------	----------	----------
	30.52 lbs/day	----------	----------	----------
Methyl isobutyl ketone	11.19 lbs/hr	1.23%	0.11%	----------
	37.31 lbs/day	----------	----------	----------
Methyl Chloroform	----------	----------	----------	----------
Mercury	----------	----------	----------	----------
Nickel	0.16 lbs/day	----------	0.38%	----------
Perchloroethylene	----------	----------	----------	----------
Phenol	5.44 lbs/hr	18.76%	----------	----------
Styrene	3.41 lbs/hr	1.05%	----------	----------
Toluene	33.94 lbs/hr	1.99%	0.18%	----------
	113.28 lbs/day	----------	----------	----------
Vinyl chloride	----------	----------	----------	----------
Xylene	25.46 lbs/hr	1.29%	0.23%	----------
	84.99 lbs/day	----------	----------	----------

As noted in Tables 1 and 2 above, the increase in each TAP's emission rate since the previous modeling demonstration, is a small percentage of each of the original individual pollutant's modeled emission rates in Zone C. Since the original modeled emission rates resulted in ambient impacts below each TAPs respective AAL, it is reasonable to conclude that the increases in emissions associated with each of the projects since the last modeling demonstration would not result in an increase in ambient impacts to the degree that the each TAPs respective AAL would be exceeded in Zone C.

Therefore, the DAQ has concluded that the addition of the proposed sources in revisions T38 through T40 will not present an unacceptable risk to human health in Zone C.

Summary of Zone D toxic air pollutant emissions (Table 1):

Compound	Modeled Emission Rates	Increase per T39 lbs/hr	Increase per T39 lbs/day	Increase per T39 lbs/yr	Increase per T40 lbs/hr	Increase per T40 lbs/day	Increase per T40 lbs/yr	Total increase in emissions
1,3-Butadiene	--------	--------	-------	--------	--------	-------	----------	----------
Acetic acid	--------	--------	-------	--------	--------	-------	----------	----------
Acrolein	--------	--------	-------	--------	--------	-------	----------	----------
Acrylonitrile	--------	--------	-------	--------	--------	-------	----------	----------
Ammonia	--------	--------	-------	--------	--------	-------	----------	----------

Arsenic	0.03 lbs/yr	--------	-------	3.31	--------	-------	----------	3.31 lbs/yr
Benzene	6.37 lbs/yr	--------	-------	--------	--------	-------	----------	----------
Beryllium	--------	--------	-------	--------	--------	-------	----------	----------
Cadmium	--------	--------	-------	--------	--------	-------	----------	----------
Chloroform	--------	--------	-------	--------	--------	-------	----------	----------
Non specific Chromium VI	--------	--------	-------	--------	--------	-------	----------	----------
Cresol	--------	--------	-------	--------	--------	-------	----------	----------
Ethylenediamine	--------	--------	-------	--------	--------	-------	----------	----------
	--------	--------	-------	--------	--------	-------	----------	----------
Di(2-Ethylhexyl) Phthalate	--------	--------	-------	--------	--------	-------	----------	----------
Formaldehyde	--------	--------	-------	--------	--------	-------	----------	----------
Hydrogen chloride	--------	--------	-------	--------	--------	-------	----------	----------
Hydrogen sulfide	--------	--------	-------	--------	--------	-------	----------	----------
n-Hexane	--------	--------	-------	--------	--------	-------	----------	----------
Manganese	--------	--------	-------	--------	--------	-------	----------	----------
Methylene chloride	--------	--------	-------	--------	--------	-------	----------	----------
	--------	--------	-------	--------	--------	-------	----------	----------
Methyl ethyl ketone	--------	--------	-------	--------	--------	-------	----------	----------
	--------	--------	-------	--------	--------	-------	----------	----------
Methyl isobutyl ketone	--------	--------	-------	--------	--------	-------	----------	----------
	--------	--------	-------	--------	--------	-------	----------	----------
Mercury	--------	--------	-------	--------	--------	-------	----------	----------
Nickel	--------	--------	-------	--------	--------	-------	----------	----------
Perchloroethylene	--------	--------	-------	--------	--------	-------	----------	----------
Phenol	--------	--------	-------	--------	--------	-------	----------	----------
Styrene	--------	--------	-------	--------	--------	-------	----------	----------
Toluene	--------	--------	-------	--------	--------	-------	----------	----------
	--------	--------	-------	--------	--------	-------	----------	----------
Vinyl chloride	--------	--------	-------	--------	--------	-------	----------	----------
Xylene	--------	--------	-------	--------	--------	-------	----------	----------
	--------	--------	-------	--------	--------	-------	----------	----------

Summary of Zone D toxic air pollutant emissions (Table 2):

Compound	Modeled Emission Rates	Modeled Percentage (lbs/hr)	Modeled Percentage (lbs/day)	Modeled Percentage (lbs/yr)
1,3-Butadiene	--------	--------	--------	--------
Acetic acid	--------	--------	--------	--------
Acrolein	--------	--------	--------	--------
Acrylonitrile	--------	--------	--------	--------
Ammonia	--------	--------	--------	--------
Arsenic	0.03 lbs/yr	--------	--------	--------
Benzene	6.37 lbs/yr	--------	--------	0.07%
Beryllium	--------	--------	--------	--------
Cadmium	--------	--------	--------	--------

Summary of Zone D toxic air pollutant emissions (Table 2):

Compound	Modeled Emission Rates	Modeled Percentage (lbs/hr)	Modeled Percentage (lbs/day)	Modeled Percentage (lbs/yr)
Chloroform	--------	--------	--------	--------
Non specific Chromium VI	--------	--------	--------	--------
Cresol	--------	--------	--------	--------
Ethylenediamine	--------	--------	--------	--------
	--------	--------	--------	--------

Di(2-Ethylhexyl) Phthalate	--------	--------	--------	--------
Formaldehyde	--------	--------	--------	--------
Hydrogen chloride	--------	--------	--------	--------
Hydrogen sulfide	--------	--------	--------	--------
n-Hexane	--------	--------	--------	--------
Manganese	--------	--------	--------	--------
Methylene chloride	--------	--------	--------	--------
	--------	--------	--------	--------
Methyl ethyl ketone	--------	--------	--------	--------
	--------	--------	--------	--------
Methyl isobutyl ketone	--------	--------	--------	--------
	--------	--------	--------	--------
Mercury	--------	--------	--------	--------
Nickel	--------	--------	--------	--------
Perchloroethylene	--------	--------	--------	--------
Phenol	--------	--------	--------	--------
Styrene	--------	--------	--------	--------
Toluene	--------	--------	--------	--------
	--------	--------	--------	--------
Vinyl chloride	--------	--------	--------	--------
Xylene	--------	--------	--------	--------
	--------	--------	--------	--------

As noted in Tables 1 and 2 above, the increase in each TAP's emission rate since the previous modeling demonstration, is a small percentage of each of the original individual pollutant's modeled emission rates in Zone D. Since the original modeled emission rates resulted in ambient impacts well below each TAPs respective AAL, it is reasonable to conclude that the increases in emissions associated with each of the projects since the last modeling demonstration would not result in an increase in ambient impacts to the degree that the each TAPs respective AAL would be exceeded in Zone D.

Therefore, the DAQ has concluded that the addition of the proposed sources in revisions T38 through T40 will not present an unacceptable risk to human health in Zone D.

IX. Public Notice:
This application will go through the 30 day public notice and 45 day EPA review when the Permittee re-submits this application for renewal or for a Significant Modification.

X. NonAttainment:
Fort Bragg Army Post is located in Cumberland County. The current Section 107 attainment status designations for areas within the state of North Carolina are summarized in 40 CFR 81.334. Cumberland County is classified as "better than national standards" for total suspended particulates (TSP, also referred to as Particulate Matter, PM, which includes particulate matter less than 10 microns, PM10) and for sulfur dioxide (SO_2). Cumberland County is designated as "unclassifiable/attainment" for carbon monoxide (CO), PM2.5 and 1-hour standard for ozone. Cumberland County is designated as "cannot be classified or better than national standards" for nitrogen dioxide (NO_2). Cumberland County is designated as "attainment" for the 8-hour standard for ozone.

XI. This facility is subject to 15A NCAC 2Q .0508(g) "Prevention of Accidental Releases". Fort Bragg submitted its Risk Management Plan (RMP) in 06/01/1999. The plan was revised in 2004 and 2010.

XII. Consistency Determination:
Fort Bragg is located on Federal property and is therefore not subject to local zoning regulations. All of the proposed modifications have been approved by the installation planning and development authority and are in accordance with the Post master plan.

XIII. For PSD Increment tracking purposes, the PSD Minor Source Baseline date was triggered in Cumberland County for particulate matter and SO_2 on July 26, 1978 and for NOx on August 20, 2001. The addition of the new sources in application 2600102.14A will increase particulate matter, sulfur dioxide, and nitrogen oxide emissions.

The potential emissions of all the proposed sources were added together for increment tracking purposes. All of the engines are subject to NSPS Subpart IIII, therefore NSPS allowable exhaust emission rates were used as the worse case emissions rates for the calculations for PM10 and NOx. AP-42 was used for SO_2 emissions calculation since the NSPS does not have an allowable emissions rate for this pollutant.

Example Calculation for generators using the higher allowable factors from Table 1 of 40 CFR 89.112 for the smaller 60 kW generator:

NSPS allowable emission rate for NOx = 4.7 g/kW-hr
NSPS allowable emission rate for PM10 = 0.4 g/kW-hr

AP-42 emission factor for SO_2 = 1.21E-01 lbs/hp-hr

Nitrogen Oxide/Sulfur dioxide/PM10 emissions for ES-187GI, 188GI, and 189GI:
The total combined kW rating for all of the proposed generators is: (400 + 80 + 60 = 540 kW).
The total combined hp rating for all of the proposed generators is: 724 hp

$$\left[\frac{4.7\text{ g NOx}}{\text{kW}-\text{hour}} \times 540\text{ kW} \times \frac{1\text{ lbs NOx}}{453.59\text{ g}}\right] = \frac{5.6\ lbs\ \text{NOx}}{\text{hour}}$$

$$\left[\frac{0.4\text{ g PM10}}{\text{kW}-\text{hour}} \times 540\ kW \times \frac{1\text{ lbs }PM10}{453.59\text{ g}}\right] = \frac{0.48\ lbs\ PM10}{\text{hour}}$$

$$\left[\frac{1.21\text{E}^{-}01\text{ g }SO_2}{\text{hp-hour}} \times 724\ hp \times \frac{1\text{ lbs }PM10}{453.59\text{ g}}\right] = \frac{0.19\ lbs\ SO_2}{\text{hour}}$$

The DAQ spread sheet for boilers was used to calculate the emissions from the total number of boilers and indirect fired hot water heaters firing No. 2 fuel oil (@ 2.73 mmBtu per hour total heat input) and from the boilers and indirect fired water heaters firing natural gas (@ 37.96 mmBtu per hour total heat input).

Maximum hourly emissions for PSD increment tracking purposes from the total modification:

Pollutant	Emergency Generators	No. 2 fuel oil-fired boiler @ 2 mmBtu/hr	Natural gas-fired boilers & indi fired heaters @ 37.96 mmBtu/hr	Total Emissions
NOx	5.6 lbs/hr	1.71 lbs/hr	16.30 lbs/hr	23.61 lbs/hr
PM10	0.48 lbs/hr	0.17 lbs/hr	0.31 lbs/hr	0.96 lbs/hr
SO_2	0.19 lbs/hr	1.82 lbs/hr	0.10 lbs/hr	2.11 lbs/hr

For PSD increment tracking purposes, the NOx emission rate is increased by 23.61 pounds per hour, the SO_2 emission rate is increased by 1.0 pounds per hour, and the PM_{10} emissions rate is increased by 2.11 pounds per hour.

XIV. The permit review and draft permit were sent to the applicant on July 28, 2014. The applicant responded with comments on July 29, 2014.

XV. Recommendations

This Minor modification issued in accordance with regulation 15A NCAC 2Q .0515 for XVII Airborne Corps and Fort Bragg, located in Fort Bragg, Cumberland County, North Carolina, has been reviewed by the DAQ to determine compliance with all procedures and requirements. The DAQ has determined that this facility is complying or will achieve compliance as specified in the permit with all applicable requirements. The Fayetteville Regional Office concurs.

Issue permit No. 04379T40

ATTACHMENT D

NORTH CAROLINA DIVISION OF AIR QUALITY Air Permit Review – Significant Modification processed in accordance with 15A NCAC 2Q .0501(c)(2) Permit Issue Date: January 24, 2014	Region: Fayetteville Regional Office County: Cumberland NC Facility ID: 2600102 Inspector's Name: Robert Hayden Date of Last Inspection: 01/24/2013 Compliance Code: 3 / Compliance - inspection
Facility Data Applicant (Facility's Name): HQ XVIII ABN Corps & Fort Bragg Facility Address: HQ XVIII ABN Corps & Fort Bragg Director of Public Works Fort Bragg, NC 28310 SIC: 9711 / National Security NAICS: 92811 / National Security Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V	Permit Applicability (this application only) SIP: 15A NCAC 2D .0503, 2D .0516, 2D .0521, 2D .0524, and 2D .1111, 2Q .0702(18) NSPS: Subpart IIII NESHAP: Subpart ZZZZ, Subpart DDDDD PSD: N/A PSD Avoidance: Will be evaluated for each project and funding code. 112(r): N/A Other: N/A NC Toxics: A toxics evaluation will be performed in accordance with G.S. 143-215.107(a); Boilers subject to MACT, engines subject to MACT
Contact Data	Application Data
Facility Contact: Gary Cullen, Air Program Manager, IMSE-BRG-PWE-C, 2175 Reilly Rd., Stop A, Ft Bragg, NC 28310, (910) 432-8464, gary.l.cullen4.civ@mail.mil Authorized Contact: Gregory Bean, Director of PWBC, IMSE-BRG-PWE, Bldg 2175 Reilly Rd., Stop A, Fort Bragg, NC 28310, (910) 396-4009 Technical Contact: Gary Cullen, Air Program Manager, IMSE-BRG-PWE, 2175 Reilly Rd., Stop A, Ft Bragg, NC 28310, (910) 432-8464, gary.l.cullen4.civ@mail.mil	Application Numbers: 2600102.13A Date Received: December 4, 2013 Application Type: Modification Application Schedule: TV-Sign-501(c)(2) Existing Permit Data Existing Permit Number: 04379T38 Existing Permit Issue Date: October 28, 2013 Existing Permit Expiration Date: 09/30/2016
Consultant: URS Group Inc. Contact: Gary Cullen Phone: (910) 432-8464 email: gary.l.cullen4@mail.mil	
Review Engineer: Booker Pullen Regional Engineer: Robert Hayden Review Engineer's Signature: Begin Date: January 13, 2014	Comments / Recommendations: Issue: 04379T39 Permit Issue Date: January 24, 2014 Permit Expiration Date: 09/30/2016

I. Introduction/Description:

Fort Bragg Army Post is home to both the 82nd Airborne Division and the XVIII Airborne Corps Headquarters. Additionally, Fort Bragg hosts the U. S. Army Special Operations Command, the U. S. Army Parachute Team (the Golden Knights), FORSCOM, and U. S. Army Reserve. The Fort Bragg Military Base is located at 2175 Reilly Road, Stop A, Cumberland County, Fort Bragg, North Carolina. Application No. 2600102.13A was received by the Raleigh Central Office, Division of Air Quality (DAQ) on December 4, 2013 and considered complete on that date. The initial submittal requested that the modification be processed as a "Minor Modification" using the revised procedures in accordance with the recent DAQ memorandum for 502(b)(10) and Minor Permit Modification at Title V Facilities, dated October 1, 2013. The processing schedule was changed to a Significant Modification in accordance with 15A NCAC 2Q .0501(c)(2) on January 13, 2014 because of the increase in toxic air pollutants from sources not subject to a MACT regulation. This permit modification is not required to go through a 30-day public notice or a 45 day EPA review at this time. A condition will be placed into the permit stating that the facility shall resubmit an application for the new sources within one year of operation of the new sources. The permit will be required upon re-submittal of the application to go through public notice and EPA review.

II. Purpose of Application 2600102.13A:

A. To Request the installation of small boilers (≤ 2.0 mmBtu/hour), hot water heaters, emergency generators, one makeup air unit heater, one fueling operation, one composting operating and one sanding operation.

B. Administrative changes:

1. Five emergency generators removed (ES-123GI, 125GI, 126GI, 114GI, 32G) from site.
2. One Outboad Engine Test Stand (IES-06E) removed from site.
3. One boiler (ES-646B) removed from site.

4. Change the Btu rating of boiler (ES-619B) from 0.15 mmBtu/hour to 0.50 mmBtu/hour.

III. The modifications to the Fort Bragg Title V Air Permit will include the following separate projects as listed in 2600102.13A:

Building No.	ID No.	Fuel Type	Rating (mmBtu/hr)	Description
PN73196				
5-5348: Conferencing and Catering Center	IES-00BI661	Natural gas	1.00	Hot water heater
	ES-769B	Natural gas	1.5	Boiler
PN64342				
3rd BCT TEMF	ES-770B	Natural gas	0.50	Boiler
PN69758				
SOF Brigade HQ Facility	ES-771B	Natural gas	0.30	Boiler
	ES-772B	Natural gas	0.30	Boiler
	ES-773B	Natural gas	0.50	Hot water heater
	ES-774B	Natural gas	0.50	Hot water heater
W912DY-10-D-0008				
347	ES-775B	Natural gas	0.70	Boiler
347	ES-776B	Natural gas	0.70	Boiler
PA60002-1P				
236	ES-777B	Natural gas	0.80	Boiler
PA63686				
A5245, 3rd BCT COF	ES-00BI66	Natural gas	0.75	Boiler
	ES-00BI67	Natural gas	0.75	Boiler
	ES-00BI68	Natural gas	0.65	Hot water heater
FA41003-2P				
289	ES-779B	Natural gas	2.00	Boiler
SA00540-1P				
1-2532, DFAC	ES-780B	Natural gas	0.50	Boiler
FA11002-9P				
2-7201, Working Dog Facility	IES-00BI662	Natural gas	0.324	Make-up air heater
N100004-3P				
A4505	ES-781B	Natural gas	0.75	Boiler
A4505	ES-782B	Natural gas	0.75	Boiler
A4505	ES-783B	Natural gas	0.75	Boiler
A4505	ES-784B	Natural gas	0.75	Boiler
A4016	ES-785B	Natural gas	0.75	Boiler
A4016	ES-786B	Natural gas	0.75	Boiler
SC00007-2P				
32245A	ES-778B	No. 2 Fuel oil	0.35	Boiler
PN59517[				
T-2662 CM Laundry Facility	ES-00BI69	Propane	1.16	Hot water heater
	ES-00BI70	Propane	1.16	Hot water heater
	ES-00BI71	Propane	1.16	Hot water heater
	ES-00BI72	Propane	0.315	Hot water heater
T-2862 CM Laundry Facility	ES-00BI73	Propane	0.60	Hot water heater
PN64340				
C-2729, 1st BCT HQ Addition	ES-100G	Diesel fuel	750 kW	Emergency generator
H92236-13-P-5551				
O-1900	ES-101G	Diesel fuel	1230 kW	Emergency generator
PN64342				
3rd BCT HQ Addition	ES-184GI	Diesel fuel	400 kW	Emergency generator
SC00015-3P				
ATF Modular TTA Site	ES-185GI	Diesel fuel	42 kW	Emergency generator
Unknown				

Forestry Antenna Site	ES-186GI	Diesel fuel	35 kW	Emergency generator
Building No.	ID No.	Fuel Type	Rating (mmBtu/hr)	Description
TO00023-3P				
P-3055, L3	IES-01SD	----------	----------	Sanding Shop operation
TA00017-3P				
Camp Mackall	IES-01FP	----------	----------	Fueling Point with 5,000 gallon JP-8 Horizontal AST and 2,000 gallon Gasoline Horizontal AST
Unknown				
O-3454, Construction and Demolition Debris (C&D) Landfill	IES-02CM	----------	----------	Composting operation
PN73196				
5-5348, Conferencing and Catering Center	IES-00BI661	Natural gas	1.0	Hot water heater used for food preparation for food consumed on-site
FA11002-9P				
2-7201, Working Dog Facility	IES-00BI662	Natural gas	0.324	Make-up air heater

IV. Changes to existing permit per application 2600102.13A:

Old Page No.	New Page No.	Condition No.	Changes
Cover Letter			
Page 1	Page 1	Heading and body of letter	Revised issue date, changed permit revision number, changed "complete application" received date,
Page 2	Page 2	Heading and body of letter	Revised date at top of letter, changed the effective date of permit, changed values for NOx, SO_2 and PM10 hourly contributions for the addition of the new sources in this application, changed EPA contact to Heather Ceron, changed DAQ signature to John C. Evans, acting chief
Page 3	Page 3	"Changes to Permit" Table	Updated the table to reflect the changes per this modification
Insignificant Activities List			
N/A	Page 1 of 5	Table of Sources	Added IES-01SD
N/A	Page 3 of 5		Added IES-01FP, removed IES-06E
N/A	Page 5 of 5		Added: IES-00BI661and IES-00BI662
Body of the Permit			
Page 1	Page 1	Cover Page	Changed: effective date of permit, issue date, revision number, application number, received date of application, "replaces permit" number, DAQ signature to John C. Evans
Page 4	Page 4	Table of Permitted Sources	Changed ES-619B Btu rating from 0.15 to 0.50 mmBtu per hour
Page 5	N/A		Removed boiler ES-646B from Permit
N/A	Page 8		Added boilers ES-769B through ES-780B, removed ES-32G
Page 13	N/A		Removed ES-114GI
Page 14	N/A		Removed ES-123GI, ES-125GI, ES-126GI
Page 47	N/A		Removed ES-32G
Page 49	N/A		Removed ES-123GI, ES-125GI, ES-126GI, ES-114GI
N/A	Page 50		Added ES-100G, ES-101G
Page 75	N/A		Removed ES-123GI, ES-125GI, ES-126GI, ES-114GI
Page 80	N/A		Removed ES-32G
N/A	90-95		Added table to list all boilers subject to MACT DDDDD

V. Statement of Compliance:
The DAQ has reviewed the compliance status of this facility. Mr. Robert Hayden of the FRO, performed a facility inspection on January 24, 2013 and the facility appeared to be in compliance with all applicable requirements.

VI. Source-by Source Evaluation for Modification Revision T39:

A. Emergency generators:

- ES-100G (Diesel fuel-fired emergency generator, 750 kW)
- ES-101G (Diesel fuel-fired emergency generator, 1230 kW)
- ES-184GI (Diesel fuel-fired emergency generator, 400 kW)
- ES-185GI (Diesel fuel-fired emergency generator, 42 kW)
- ES-186GI (Diesel fuel-fired emergency generator, 35 kW)

1. Description:
All of the emergency generators are fired by Diesel fuel only. For potential emission calculations, 500 maximum hours of operation were used per the 1995 EPA guidance from John S. Seitz, Director of the Office of Air Quality Planning and Standards. The emission of pollutants from each generator unit is uncontrolled.

2. Applicable Regulatory Requirements: Under the current regulatory requirements, new combustion sources will be evaluated for toxic air pollutants in accordance with G.S. 143-215.107.

All of the emergency generator engines in this application are subject to NSPS (Subpart IIII), and MACT (Subpart ZZZZ). Subpart ZZZZ was revised, and re-published in the Federal Register on January 18, 2008 with an effective date of March 18, 2008. This revision included engines with capacities greater than 500 brake horsepower and engines with capacities less than 500 brake horsepower located at major sources of HAP emissions.

<u>40 CFR Part 60, New Source Performance Standard, Subpart IIII:</u>

- Per 40 CFR §60.4200(a) NSPS, Subpart IIII does apply to these emergency generators because of their manufacture date.

<u>40 CFR Part 63, Maximum Achievable Control Technology, Subpart ZZZZ</u>

- Per 40 CFR §63.6590(a)(2)(ii), a stationary RICE with a site rating of equal to or less than 500 brake hp located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12, 2006. A stationary RICE with a site rating of more than 500 brake hp located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after December 19, 2002.

- Per 40 CFR §63.6590(c)(6) "Stationary RICE Subject Regulations under 40 CFR Part 60" a new compression ignition emergency generator with a site rating <u>less than 500</u> brake horsepower located at a major source of HAP emissions <u>can meet</u> the requirements of Subpart ZZZZ by meeting the requirements of NSPS Subpart IIII. No further requirements apply for such engines under this part.

- Per 40 CFR §63.6600(c), an applicant that operates stationary emergency RICE with a site rating of <u>more than 500 brake HP</u> located at a major source of HAP emissions, <u>does not</u> need to comply with the emission limitations in Tables 1a, 2a, 2c, and 2d to this subpart or operating limitations in Tables 1b and 2b to this Subpart.

The following provides a summary of limits and/or standards for the emission sources described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Visible emissions	20 percent opacity	15A NCAC 2D .0521
Sulfur dioxide	Burn fuel that contains less than 15 parts per million sulfur content	15A NCAC 2D .0524 40 CFR Part 60 Subpart IIII
Hazardous Air Pollutants	Meet the requirements of NSPS Subpart IIII for emergency units less than 500 hp • ES-185GI (42 kW, 56.3 hp) • ES-186GI (35 kW, 46.9 hp) Meet requirements of 40 CFR 63.6640(f) for emergency units greater than 500 hp • ES-100G (750 kW, 1005.8 hp) • ES-101G (1230 kW, 1649.5 hp) • ES-184GI (400 kW, 603.5 hp)	15A NCAC 2D .1111 40 CFR Part 63, Subpart ZZZZ
NMHC + NOx, HC, NOx, CO, PM	For emergency engines: Purchase engine certified to meet the applicable engine design emission limits	15A NCAC 2D .0524 40 CFR Part 60 Subpart IIII
Toxic air pollutants	Evaluation required	15A NCAC 2Q .0702(18) G.S. 143-215.107

a. 15A NCAC 2D .0521"Control Of Visible Emissions"

Regulation Analysis:

i. Generators will be installed after July 1, 1971, and each is therefore subject to the State regulation 15A NCAC 2D .0521(d). Per this regulation visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute periods averaging more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period for each boiler.

Compliance is expected with this regulation because all of the generators will be firing diesel fuel.

Monitoring/Recordkeeping/Reporting [15A NCAC 2Q .0508(f)]

ii. No monitoring, recordkeeping, or reporting is required for visible emissions from the firing of diesel fuel in any engine because it should always be in compliance with the opacity standard during normal operation.

b. 15A NCAC 2D .1111, 40 CFR Part 63, Subpart ZZZZ: National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines

i. General Provisions [40 CFR §63.6665]:
The Permittee shall comply with the requirements of 40 CFR part 63 Subpart A "General provisions," according to the applicability of Subpart A to such sources, as identified in Table No. 8 in Subpart ZZZZ, "Applicability of General Provisions to Subpart ZZZZ".

ii. Compliance/Notification Procedures [40 CFR §63.6645]
Per 40 CFR §63.6590(c) "Stationary RICE Subject Regulations Under 40 CFR Part 60", new emergency compression ignition generators less than 500 brake horsepower site rating must only meet the requirements of NSPS, Subpart IIII. Per 40 CFR §63.6600(c), and applicant that operates stationary emergency RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, does not need to comply with the emission limitations in Tables 1a, 2a, 2c, and 2d to this subpart or operating limitations in Tables 1b and 2b to this Subpart.

iii. Recordkeeping Requirement For Applicability Determination [40 CFR §63.10(b)(3)]
The applicability determination for exclusion of the emergency generators from the requirements of 40 CFR Part 63, Subpart ZZZZ and Subpart A of this part, shall be maintained on site for a period of 5 years after the determination, or until the source changes its operations to become an affected source, whichever comes first. The analyses, or other information, that demonstrates the exemption from the requirements of Subpart ZZZZ and part A of this subpart, shall be signed by the person making the determination.

iv. Monitoring/Reporting [15A NCAC 2Q .0508(f)]
- Owner/operators who purchase an emergency generator that is less that 30 liters per cylinder must purchase units that are certified by the manufacturer to meet the applicable engine design emission limits. {§60.4211 (c)}.
- Owners/operators must operate and maintain engines and control devices in accordance with the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the life of the engine. {§60.4206 and §60.4211 (a)}.
- No testing is required for units less than 30 liter per cylinder displacement that have been certified by the manufacturer to meet design limits.
- Install a nonresettable hour meter {§60.4209(a)}.

c. 15A NCAC 2D .0524: NEW SOURCE PERFORMANCE STANDARDS, SUBPART IIII

Applicability [15A NCAC 2Q .0508(f), 40 CFR 60.4200(a)(2(i))]

i. For each engine, the Permittee shall comply with all applicable provisions, including the requirements for emission standards, notification, testing, reporting, record keeping, and monitoring, contained in Environmental Management Commission Standard 15A NCAC 2D .0524 "New Source Performance Standards (NSPS)" as promulgated in 40 CFR Part 60 Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines," including Subpart A "General Provisions."

General Provisions [15A NCAC 2Q .0508(f)]

ii. Pursuant to 40 CFR 60 .4218, The Permittee shall comply with the General Provisions of 40 CFR 60 Subpart A as presented in Table 8 of 40 CFR 60 Subpart IIII.

Emission Standards [15A NCAC 2Q .0508(f)]

iii. The Permittee shall comply with the emission standards for new non-road CI engines in 40 CFR 60.4202, for all pollutants, for the same model year and maximum engine power for this source. [40CFR 60.4205(b)]

Fuel Requirements [15A NCAC 2Q .0508(f)]

iv. The Permittee shall use diesel fuel in the engine with:
i. a maximum sulfur content of 15 ppm; and
ii. a minimum cetane index of 40 or a maximum aromatic content of 35 volume percent.
[40CFR 60.4207(b) and 40CFR 80.510(b)]

Testing [15A NCAC 2Q .0508(f)]

v. If emission testing is required, the testing shall be performed in accordance with General Condition JJ. If the results of this test are above the limits given in above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524.

Monitoring [15A NCAC 2Q .0508(f)]

vi. The engine has the following monitoring requirements:
(A) The engine shall be equipped with a non-resettable hour meter prior to startup. [40CFR 60.4209(a)]
(B) The engine, if equipped with a diesel particulate filter, must be installed with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached. [40CFR 60.4209(b)]

Compliance Requirements [15A NCAC 2Q .0508(b)]

vii. The Permittee shall:
(A) Operate and maintain the engines and control devices according to the manufacturer's emission related-written instructions over the entire life of the engine;
(B) Change only those emission-related settings that are permitted by the manufacturer; and
(C) Meet the requirements of 40 CFR 89, 94 and/or 1068 as applicable.
[40CFR 60.4206 and 60.4211(a)]

viii. The Permittee shall comply with the emission standards for emergency generators by purchasing an engine certified to the emission standards in condition c. The engine shall be installed and configured according to the manufacturer's emission-related specifications. [40CFR 60.4211(c)]

ix. Emergency stationary ICE may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. There is no time limit on the use of emergency stationary ICE in emergency situations. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. Emergency stationary ICE may operate up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply non-emergency power as part of a financial arrangement with another entity. For owners and operators of emergency engines, any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as permitted in this section, is prohibited. [40CFR 60.4211(f)]

The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524, if the requirements in the conditions listed above in this section.

Recordkeeping [15A NCAC 2Q .0508(f)]

x. To assure compliance, the Permittee shall perform inspections and maintenance on the engine as recommended by the manufacturer per 40 CFR 60.4206 and 40 CFR 60.4211(a). The results of inspection and maintenance shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request. The logbook shall record the following:
(A) the date and time of each recorded action;
(B) the results of each inspection;
(C) the results of any maintenance performed on the engine;
(D) any variance from manufacturer's recommendations, if any, and corrections made;
(E) the hours of operation of the engine in emergency and non-emergency service. [40 CFR 60.4214(b)]
(F) If a PM filter is used, records of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit of the engine is approached [40 CFR60.4214(c)]; and
(G) Documentation from the manufacturer that the engine is certified to meet the emission standards in condition c.

The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524 if these records are not maintained.

Reporting [15A NCAC 2Q .0508(f)]

xi. The Permittee shall submit a summary report of monitoring and recordkeeping activities postmarked on or before January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period

between January and June. All instances of noncompliance with the requirements of this permit shall be clearly identified.

d.The following PSD evaluation is for the individual projects that involve the installation of Diesel fuel fired emergency generators. Fort Bragg is a PSD major source for criteria pollutants. Modifications are evaluated against the PSD major source significance levels according to individual projects.

The Diesel fuel-fired engines will emit CO, NOx, PM, PM10, PM2.5, SO_2, VOCs, and GHGs. All of the proposed engines will be subject to NSPS Subpart IIII and are therefore required to meet the limitations in this Subpart for CO, NOx, PM10, and VOCs.

Pollutant	Major Source Significance level
GHGs	75,000 tpy
PM	25 tpy
PM10	15 tpy
PM2.5	10 tpy
SO_2	40 tpy
VOCs	40 tpy
CO	100 tpy
NOx	40 tpy

The individual project (H92236-13-P-5551) for the installation of one Diesel fuel-fired emergency generator (ES-101G, 1230 kW) represents the project with the largest emission rate of criteria pollutants from an engine. These emissions however do not exceed the PSD significance threshold levels when operating at a maximum 500 hours per year.

The example calculation was made using the following data:
- Using 500 hour per year maximum operation for emergency generator ES-101G
- Maximum kW rating = 1230 kW (1649.43 hp)`
- NOx = 6.4 g/kW-hr (NSPS Subpart IIII, 40 CFR 89.112 emission limit)
- CO = 3.5 g/kW-hr (NSPS Subpart IIII, 40 CFR 89.112 emission limit)
- PM/PM10 = 0.2 g/kW-hr (NSPS Subpart IIII, 40 CFR 89.112 emission limit)
- PM2.5 = 7.0E-04 lbs/hp-hour (DAQ spread sheet)
- SO_2 = 4.05E-03 lbs/hp-hour (DAQ spread sheet)
- VOCs = 6.42E-04 lbs/hp-hour (DAQ spread sheet)

From 40 CFR Part 98, "Mandatory Green House Gas Reporting", Tables C-1 and C-2), Revised 11/29/2013
- Emission factor for No. 2 fuel oil = 73.96 kg CO_2/mmBtu
- Emission factor for No. 2 fuel oil = 3.0E-03 kg CH_4/mmBtu
- Emission factor for No. 2 fuel oil = 6.0E-04 kg N_2O/mmBtu

Globing Warming Potentials from 40 CFR Part 98, A-1 (CO_2 equivalence), Revised 11/29/2014
- CO_2 = 1
- CH_4 = 25
- N_2O = 298

GHGs (CO_2, CH_4, N_2O):
Fort Bragg is a major PSD source for GHG emissions (> 100,000 tpy). The GHG emission factors were taken from 40 CFR Part 98 "Mandatory Greenhouse Gas Reporting", Subpart C, Table C-2 for Petroleum fuel types, revised November 29, 2013. The total GHG emission rate from the H92236-13-P-5551 project at Building 0-1900 is less than 75,000 tons per year (at 480 tpy CO_{2e}) threshold. Therefore, no PSD avoidance condition for GHGs is required. *See example calculations below.*

GHGs:
In accordance with EPA's AP-42 Chapter 3.3 (Table 3.3-1; Reference a), an average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr was used to convert from lb/mmBtu to lb/hp-hr when necessary. GHGs (CO_{2e}) are less than the PSD significance level (75,000 tpy)

$$\frac{1230\ kW}{engine} \times \frac{1.341\ hp}{1\ kW} \times\ = \frac{1649.43\ hp}{engine}$$

$$\frac{73.96\ kg\ CO_2}{1\times10^6\ Btu} \times \frac{1000\ g}{kg} \times \frac{1\ lb}{453.59\ g} \times \frac{7000\ Btu}{hp-hr} \times \frac{1649.43\ hp}{1} \times \frac{1\ ton}{2000\ lbs} \times \frac{500\ hrs}{year} \times \frac{1\ tons\ CO_{2e}}{1\ ton\ CO_2} = \frac{470.7\ tons\ CO_{2e}}{year}$$

$$\frac{3.0E-03\ kg\ CH_4}{1\times10^6\ Btu} \times \frac{1000\ g}{kg} \times \frac{1\ lb}{453.59\ g} \times \frac{7000\ Btu}{hp-hr} \times \frac{1649.43\ hp}{1} \times \frac{1\ ton}{2000\ lbs} \times \frac{500\ hrs}{year} \times \frac{25\ tons\ CO_{2e}}{1\ ton\ CO_2} = \frac{0.47\ tons\ CO_{2e}}{year}$$

$$\frac{6.0E-04\ kg\ N_2O}{1\times10^6\ Btu} \times \frac{1000\ g}{kg} \times \frac{1\ lb}{453.59\ g} \times \frac{7000\ Btu}{hp-hr} \times \frac{1649.43\ hp}{1} \times \frac{1\ ton}{2000\ lbs} \times \frac{500\ hrs}{year} \times \frac{298\ tons\ CO_{2e}}{1\ ton\ CO_2} = \frac{1.14\ tons\ CO_{2e}}{year}$$

Total CO_2e burning No. 2 fuel oil (Diesel fuel) = 470.7 + 0.47 + 1.14 = 472.31 tons CO_2e per year total.

NOx emissions from project H92236-13-P-5551 project at Building 0-1900:
NOx emissions (4.3 tpy at 500 hrs/yr) are less than the 40 tpy significance level.

$$\frac{6.4\ g\ NOx}{kW-hr} \times \frac{1\ lbs\ NOx}{453.59\ g} \times \frac{1230\ kW}{1} \times \frac{1\ \text{ton NOx}}{2000\ \text{lbs NOx}} \times \frac{500\ \text{hrs}}{\text{year}} = \frac{4.3\ \text{tons NOx}}{\text{year}}$$

PM/PM10 emissions from H92236-13-P-5551 project at Building 0-1900:
PM/PM10 emissions (0.14 tpy at 500 hrs/yr) are less than the 25 tpy significance level and PM10 emissions (0.14 tpy at 500 hrs/yr) are less than the 15 tpy significance level.

$$\frac{0.20\ g\ PM\ /\ PM10}{kW-hr} \times \frac{1\ lbs\ PM\ /\ PM10}{453.59\ g} \times \frac{1230\ kW}{1} \times \frac{1\ \text{ton}\ PM\ /\ PM10}{2000\ \text{lbs}\ PM\ /\ PM10} \times \frac{500\ \text{hrs}}{\text{year}} = \frac{0.14\ \text{tons}\ PM\ /\ PM10}{\text{year}}$$

PM2.5 emissions from project H92236-13-P-5551 project at Building 0-1900:
PM2.5 emissions (0.29 tpy at 500 hrs/yr) are less than the 10 tpy significance level.

$$\frac{7.0E-04\ lbs\ PM\ 2.5}{hp-hr} \times 1649.43\ hp \times \frac{1\ \text{ton}\ PM\ 2.5}{2000\ \text{lbs}\ PM\ 2.5} \times \frac{500\ \text{hrs}}{\text{year}} = \frac{0.29\ \text{tons}\ PM\ 2.5}{\text{year}}$$

SO_2 emissions from H92236-13-P-5551 project at Building 0-1900:
NSPS Subpart IIII does not have an emission limit for SO, but it does require that all Diesel fuel fired in the engines contain less than 0.15% by weight sulfur. The SO_2 emission factor used is from AP-42, table 3.4-1 (greater than 600 hp) was corrected to 15% sulfur by weight. SO_2 emissions (0.50 tpy at 500 hrs/yr) are less than the 40 tpy significance level.

$$\left[\frac{8.09\text{E-}03\ lbs\ SO_2 \times 0.15}{\text{hp-hour}} \times 1649.43\ hp \times\ \right] \times \frac{1\ \text{ton}}{2000\ \text{lbs}} \times \frac{500\ \text{hrs}}{\text{year}} = \frac{0.50\ \text{tons}\ SO_2}{\text{year}}$$

CO emissions from H92236-13-P-5551 project at Building 0-1900: CO emissions (3.18 tpy at 500 hrs/yr) are less than the 100 tpy significance level.

$$\frac{3.5\ g\ CO}{kW-hr} \times \frac{1\ lbs\ CO}{453.59\ g} \times \frac{1649.43\ kW}{1} \times \frac{1\ \text{ton}\ CO}{2000\ CO} \times \frac{500\ \text{hrs}}{\text{year}} = \frac{3.18\ \text{tons}\ CO}{\text{year}}$$

VOCs emissions from H92236-13-P-5551 project at Building 0-1900:
NSPS Subpart IIII does not have a separate emission limit for VOCs for this model year generator. The VOC emission factor used is from DAQ spread sheet (greater than 600 hp). VOC emissions (0.26 tpy at 500 hrs/yr) are less than the 40 tpy significance level.

$$\frac{6.42E-04\ lbs\ VOC}{hp-hr}\times\frac{1649.43\ hp}{1}\times\frac{1\ \text{ton}\ VOC}{2000\ \text{lbs}\ VOC}\times\frac{500\ \text{hrs}}{\text{year}}=\frac{0.26\ \text{tons}\ VOC}{\text{year}}$$

B. The boilers, indirect-fired hot water heaters, and hot water boilers listed in Sections III., Table 1 of this review. The heat input from all of the applicable units will be reviewed in accordance with 15A NCAC 2D .0503 because NSPS does not have a particulate emission standard for boilers that are less than 10 million Btu per hour heat input.

3. Description: All of the boilers and hot water heaters at Fort Bragg are used for domestic purposes only and not to heat water for a production process. Historically the Division of Air Quality has permitted comfort heat boilers at military bases and universities because of the size and the large number of boilers. The units at military bases are usually funded separately under a variety of projects and are therefore evaluated by the separately funded projects. The boilers, and water heaters are subject to the Boiler MACT and will be listed in the body of the permit.

4. Applicable Regulatory Requirements: The small boilers in this modification are placed into the body of the permit because they are subject to the boiler MACT. These are new boilers, but NSPS Subpart Dc does not apply because each of the units is less than 10 million Btu per hour heat input. These boilers will be evaluated for toxic air pollutants in accordance with G.S. 143-215.107(a).

   15A NCAC 2D .1111 "Boiler MACT, Subpart DDDDD" will apply to the boilers in this modification because they will commence construction after June 4, 2010. Boilers and process heaters in the units designed to burn gas 1 fuels (natural gas) subcategory with a heat input capacity of less than or equal to 5 million Btu per hour must complete a tune-up every 5 years as specified in § 63.7540. Boilers and process heaters in the units designed to burn gas 1 fuels subcategory with a heat input capacity greater than 5 million Btu per hour and less than 10 million Btu per hour must complete a tune-up every 2 years as specified in § 63.7540. Boilers and process heaters in the units designed to burn gas 1 fuels subcategory are not subject to the emission limits in Tables 1 and 2 or 11 through 13 to this subpart, or the operating limits in Table 4 to this subpart [40 CFR 63.7500(e)]. This regulation does not apply to hot water heaters that are heated by gaseous or liquid fuel with a capacity of no more than 120 US gallon capacity.

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Particulate matter	0.18 lbs per million Btu heat input	15A NCAC 2D .0503
Sulfur dioxide	2.3 pounds per million Btu heat input	15A NCAC 2D .0516
Visible emissions	20 percent opacity	15A NCAC 2D .0521
Toxic air pollutants	Evaluation required by the DAQ	G.S. 143-215.107
HAPS	Work practice standards	15A NCAC 2D .1111 Subpart DDDDD

Because these boilers are not subject to NSPS Subpart Dc (heat inputs less than 10 million Btu per hour), particulate emission rates will have allowable emission rates in accordance with 15A NCAC 2D .0503 (e). Per this regulation, the maximum heat input shall be the total heat content of all fuels that are burned in a fuel burning indirect heat exchanger, of which the combustion products are emitted through a stack or stacks. The sum of maximum heat input of all fuel burning indirect heat exchangers at a plant site that are in operation, under construction, or permitted pursuant to 15A NCAC 2Q, shall be considered as the total heat input for the purpose of determining the allowable emission limit for particulate matter for each fuel burning indirect heat exchanger.

Fuel burning indirect heat exchangers constructed or permitted after February 1, 1983, shall not change the allowable emission limit of any fuel burning indirect heat exchanger whose allowable emission limit has previously been set.

The removal of a fuel burning indirect heat exchanger shall not change the allowable emission limit of any fuel burning indirect heat exchanger whose allowable emission limit has previously been established. However, for any fuel burning indirect heat exchanger constructed after, or in conjunction with, the removal of another fuel burning indirect heat exchanger at the plant site, the maximum heat input of the removed fuel burning indirect heat exchanger shall no longer be considered in the determination of the allowable emission limit of any fuel burning indirect heat exchanger constructed after or in conjunction with the removal.

a. 15A NCAC 2D .0503: PARTICULATES FROM FUEL BURNING INDIRECT HEAT EXCHANGERS

iii. Emissions of particulate matter from the combustion of natural gas that are discharged from these sources into the atmosphere shall not exceed 0.18 pounds per million Btu heat input. [15A NCAC 2D .0503(a)]

Table 2 Heat input values for boilers currently permitted at Fort Bragg and the new boilers per application (2600102.13A):

ID No.	Heat input (mmBtu/hr)	Type of fuel	Description	Project
Boilers, and water heaters currently at facility	1031.2 mm/Btu hr total at the facility as of revision T38	Natural gas, No. 2 fuel oil, recycled No. 2 fuel oil, Diesel fuel	Various combustion devices	----------
ES-619B	Increased by 0.35 mmBtu/hr	Natural gas	Boiler	----------
IES-00BI66	1.0 mmBtu/hr	Natural gas	Hot water boiler	PN73196
ES-769B	1.5 mmBtu/hr	Natural gas	Boiler	
ES-770B	0.5 mmBtu/hr	Natural gas	Boiler	PN64342
ES-771B	0.30 mmBtu/hr	Natural gas	Boiler	PN69758
ES-772B	0.30 mmBtu/hr	Natural gas	Boiler	
ES-773B	0.50 mmBtu/hr	Natural gas	Hot water heater (125 gallons)	
ES-774B	0.50 mmBtu/hr	Natural gas	Hot water heater (125 gallons)	
ID No.	Heat input (mmBtu/hr)	Type of fuel	Description	Project
ES-775B	0.70 mmBtu/hr	Natural gas	Boiler	W912DY-10-D-0008
ES-776B	0.70 mmBtu/hr	Natural gas	Boiler	
ES-777B	0.80 mmBtu/hr	Natural gas	Boiler	PA60002-1P
ES-778B	0.35 mmBtu/hr	No. 2 fuel oil	Boiler	SC00007-2P
ES-00BI66	0.75 mmBtu/hr	Natural gas	Boiler	PA63686
ES-00BI67	0.75 mmBtu/hr	Natural gas	Boiler	
ES-00BI68	0.65 mmBtu/hr	Natural gas	Hot water heater	
ES-779B	2.00 mmBtu/hr	Natural gas	Boiler	FA41003-2P
ES-780B	0.50 mmBtu/hr	Natural gas	Boiler	SA00540-1P
ES-781B	0.75 mmBtu/hr	Natural gas	Boiler	N100004-3P
ES-782B	0.75 mmBtu/hr	Natural gas	Boiler	
ES-783B	0.75 mmBtu/hr	Natural gas	Boiler	
ES-784B	0.75 mmBtu/hr	Natural gas	Boiler	
ES-785B	0.75 mmBtu/hr	Natural gas	Boiler	
ES-786B	0.75 mmBtu/hr	Natural gas	Boiler	
ES-00BI69	1.16 mmBtu/hr	Propane	Hot water heater	PN59517
ES-00BI70	1.16 mmBtu/hr	Propane	Hot water heater	
ES-00BI71	1.16 mmBtu/hr	Propane	Hot water heater	
ES-00BI72	0.315 mmBtu/hr	Propane	Hot water heater	
ES-00BI73	0.60 mmBtu/hr	Propane	Hot water heater	

Total for this modification = 21.045 mmBtu/hr
Remove boiler ES-646B = - 1.5 mmBtu/hr
Total heat input at the facility = 1031.2 – 1.5 + 21.045 = 1050.75 mmBtu/hr heat input

$E = 1.090 \times Q^{-0.2594}$ Where: E = allowable PM emission rate in lbs/mmBtu heat input
Q = maximum heat input rate in million Btu per hour

$E = 1.090 \times Q^{-0.2594}$
$E = 1.090 \times (1050.75)^{-0.2594}$
$E_{allow} = 0.18$ pounds PM per million Btu heat input

The particulate matter emission rate from the burning of natural gas and/or No. 2 fuel oil in any boiler was estimated using AP-42 factors, Supplement E, revised 9/98.

- Heating value natural gas = 1020 Btu per cubic foot
- Heating value No. 2 fuel oil = 141,000 Btu per gallon
- Heating value propane = 91,000 Btu per gallon

$$\frac{7.6\ lbs PM}{10^6\ cubic\ feet} \times \frac{1\ cubic\ foot\ natural gas}{1020\ Btu} \times \frac{10^6\ Btu}{million Btu} = \frac{0.0074\ lbs PM}{million Btu}$$

$$\frac{2.38 lbs PM}{10^3\ gallons No.2\ fuel\ oil} \times \frac{1\ gallon No.2\ fuel\ oil}{141{,}000\ Btu} \times \frac{10^6\ Btu}{million Btu} = \frac{0.017\ lbs PM}{million Btu}$$

$$\frac{0.7 lbs PM}{10^3\ gallons propane} \times \frac{1\ gallon liquid\ propane}{91{,}000\ Btu} \times \frac{10^6\ Btu}{million Btu} = \frac{0.008\ lbs PM}{million Btu}$$

Compliance is indicated when any of the boilers or hot water heaters burn natural gas, propane or

No. 2 fuel oil, since the actual emission rate of each is less than the allowable emission rate (0.18 lbs PM per million Btu heat input).

Testing [15A NCAC 2D .0501(c)(3)]

ii. If emission testing is required, the testing shall be performed in accordance General Condition JJ located in Section 3 of the Air Permit. If the results of this test are above the limit given above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0503.

Monitoring [15A NCAC 2Q .0508(f)]

iii. No monitoring, recordkeeping, or reporting is required for particulate emissions from the firing of natural gas, propane or No. 2 fuel oil in any boiler or hot water heater.

b. 15A NCAC 2D .0516: SULFUR DIOXIDE EMISSIONS FROM COMBUSTION SOURCES

i. Emissions of sulfur dioxide from these sources shall not exceed 2.3 pounds per million Btu heat input. Sulfur dioxide formed by the combustion of sulfur in fuels, wastes, ores, and other substances shall be included when determining compliance with this standard. [15A NCAC 02D .0516]

Testing [15A NCAC 2D .2601]

ii. If emission testing is required, the testing shall be performed in accordance with 15A NCAC 2D .2601 and General Condition JJ found in Section 3 of the Permit. If the results of this test are above the limit given above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0516.

AP-42 emission factor for natural gas = 0.6 lbs SO_2/mmcf

AP-42 emission factor for No. 2 fuel oil with (0.5% by weight S) = 71 lbs SO_2/1000 gallons
DAQ emission factor for propane = 0.02 lbs/1000 gallons

$$\frac{0.6\ lbs\ SO_2}{10^6\ cubic\ \ feet\ \ natural\ \ gas} \times \frac{1\ cubic\ \ foot\ \ natural\ \ gas}{1020\ Btu} \times \frac{10^6\ Btu}{million\ \ Btu} = 0.00058\ \frac{lbs\ PM}{million\ \ Btu}$$

$$\frac{71.0\ lbs\ SO_2}{10^3\ gallons\ \ No.\ 2\ \ fuel\ \ oil} \times \frac{1\ gallon\ \ No.\ 2\ \ fuel\ \ oil}{141{,}000\ Btu} \times \frac{10^6\ Btu}{million\ \ Btu} = \frac{0.5\ lbs\ SO_2}{million\ \ Btu}$$

$$\frac{0.02\ lbsSO_2}{10^3\ gallonspropane} \times \frac{1\ gallonpropane}{91{,}000\ Btu} \times \frac{10^6\ Btu}{million\ Btu} = \frac{0.0002\ lbsSO_2}{million\ Btu}$$

Compliance is indicated when any boiler or hot water heater burns natural gas, propane or No. 2 fuel oil since the actual emission rate of each is less than the allowable emission rate (2.3 lbs SO_2 per million Btu heat input).

Monitoring/Recordkeeping [15A NCAC 2Q .0508(f) and 15A NCAC 2D .2601]

iv. No monitoring, recordkeeping, or reporting is required for sulfur dioxide emissions from the firing of natural gas, propane or No. 2 fuel oil in any boiler or hot water heater.

c. 15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS

i. Visible emissions from any of the natural gas-fired, propane-fired, or No. 2 fuel oil fired units shall not be more than 20 percent opacity when averaged over a six-minute period. However, six-minute averaging periods may exceed 20 percent not more than once in any hour and not more than four times in any 24-hour period. In no event shall the six-minute average exceed 87 percent opacity. [15A NCAC 02D .0521 (d)]

Testing [15A NCAC 02D .2601]

iv. If emission testing is required, the testing shall be performed in accordance with 15A NCAC 2D .2601 and General Condition JJ. If the results of this test are above the limit given above, the Permittee shall be deemed in noncompliance with 15A NCAC 02D .0521.

iii. Monitoring/Recordkeeping/Reporting [15A NCAC 02Q .0508(f)]
No monitoring, recordkeeping, or reporting is required for visible emissions from the firing of natural gas, propane or No. 2 fuel oil in any boiler or water heater.

d. PSD Evaluation for the boilers in application 2600102.13A:
Due to the operational tempo and structure of this military facility, projects are frequently initiated and funded separately by various different tenants who all fall under the ownership of Fort Brag Army Post. These projects are appropriated separately by Congress, the emissions are calculated separately for each funding code, and evaluated independently against the PSD major modification thresholds.

In this application the project with the largest heat input was N100004-3P to be located at Building A4505. The combined heat input (4.5 mmBtu per hour) for the six boilers (ES-781B through 786B) firing natural gas was used in the following calculations. The DAQ spread sheet http://www.daq.state.nc.us/permits/spreadsheets/), Revision K, 6/19/2012 was used.

Total heat input = 4.5 mmBtu per hour
Fuel = natural gas
Uncontrolled

Pollutant	NOx	VOCs	PM	PM10	PM2.5	GHGs	SO_2	CO
Value	1.93 tpy	0.11 tpy	0.15 tpy	0.15 tpy	0.11 tpy	2,306.1 tpy (CO_{2e})	0.01 tpy	1.62 tpy

PSD Threshold	40 tpy	40 tpy	25 tpy	15 tpy	10 tpy	75,000 tpy (CO_{2e})	40 tpy	100 tpy

The PSD threshold is not exceeded for any criteria pollutant.

C. Fueling Point (IES-01FP):
- Aboveground, horizontal storage tank, 2000 gallon capacity, Gasoline)
- Aboveground, horizontal storage tank, 5000 gallon capacity, JP-8 fuel)

1. Description: This tank stores fuel that is used in equipment at the Fort Bragg facility.

2. Applicable Regulatory Requirements: This source will be permitted in accordance with 15A NCAC 2D .0503(8) and added to the insignificant activities list. Emissions were calculated in Appendix B of the application and estimated to be less than five tons per year and HAPs less than 1000 lbs per year.

   Storage tank emissions are calculated using US EPA AP-42 emission factors, Section 5.2, Transportation and Marketing of Petroleum Liquids, Table 5.2-7. The value used to estimate gasoline dispensing losses is 0.7 lbs VOC/Mgal fuel throughput. Storage tank emissions are calculated using emission factors developed from TANKS4.09. The factors are then applied using the fuel speciation. The equations listed below demonstrate how emissions were calculated for each tank.

   <u>Emission Calculations for Storage Tank Surrogates</u>
   Speciated emission factors: Weight Fraction x EF
   Annual Emissions (lb/yr) = Vapor Weight Fraction x (Standing Losses (lbs/yr) + Working Losses (lbs/yr)
   Standing Losses (lbs/yr) = S_LOSS Emission Factor {(lbs/hr-gal)} x Actual Storage Volume of Tank (gal) x 8760 (hrs/yr)
   Working Losses (lbs/yr) = W_LOSS Emission Factor (lb/gal) x Potential Tank Throughput (gal)
   Fuel Dispensing Emissions (lbs/yr) = Fuel Dispensing Factor (0.7 lbs/Mgal) x

		Tank Emission Factors			Tank Results	
ID No.	Tank Contents	S_LOSS (lbs/hr-gal)	W_LOSS (lbs/gal)	Annual Throughput	S_LOSS (lbs/yr)	W_LOSS (lbs/yr)
IES-01FP	Gasoline	2.17E-05	6.43E-03	18,000 gallons	380.73	115.69
	JP-8	5.48E-08	3.13E-05	60,000 gallons	2.4	1.88

1) The weather data for Raleigh was used as it is the geographically closest city in TANKS4.09.
2) For TANKS4.09 runs, all tanks were assumed to be in good working condition and were entered with a color or shade of gray/light.

The following table has the vapor weight fraction of gasoline and JP-8. These vapor weight fractions are applied to the derived emissions factors from the TANKS4.09 results and AP-42 fuel dispensing factor to develop an emission factor for each compound.

The product of the standing loss emission factor, the total capacity of the tank, 8760 hours/yr operation, and the vapor weight fraction, are used to calculate the standing loss emissions for each tank.

The product of the working loss emission factor, the potential tank throughput, and the vapor weight fraction are used to calculate the working loss emission for each tank.

Table (Storage Tanks)

Compound	Gasoline Vapor Wt Fraction	JP-8 Vapor Weight Fraction	Emissions Gasoline Tk (tpy)	Emissions JP-8 Tk (tpy)	Emissions Gasoline dispensing	Emissions JP-8 Fuel dispensing	Total Emissions (IES-01FP)
Volatile Organic Compounds	1.00	1.00	0.248 tpy	0.002 tpy	0.01 tpy	0.00 tpy	0.26 tpy
			(lbs/yr)	(lbs/yr)	(lbs/yr)	(lbs/yr)	(lbs/yr)
2,2,4-Trimethylpentane	9.5E-03	3.3E-03	4.73 lbs/yr	0.014	0.12	0.01	4.87

Benzene	6.3E-03	2.2E-02	3.10 lbs/yr	0.092	0.08	0.04	3.31
Biphenyl	N/A	8.7E-06	N/A	0.00004	N/A	0.00002	0.0001
Cresol (mixed isomers)	6.5E-06	3.8E-05	0.003 lbs/yr	0.0002	0.0001	0.0001	0.004
Cumene	1.7E-04	1.9E-03	0.082 lbs/yr	0.008	0.002	0.004	0.10
Ethylbenzene	6.3E-04	8.9E-03	0.313 lbs/yr	0.038	0.01	0.02	0.38
Naphthelene	5.5E-06	8.0E-04	0.003 lbs/yr	0.003	0.0001	0.001	0.01
N-Hexane	4.4E-02	2.3E-01	21.99 lbs/yr	0.977	0.56	0.43	23.96
Phenol	1.1E-06	1.4E-04	0.001 lbs/yr	0.001	0.00001	0.0003	0.001
Styrene	8.8E-04	N/A	0.438 lbs/yr	N/A	0.01	N/A	0.45
Toluene	8.4E-03	6.0E-02	4.18 lbs/yr	0.257	0.11	0.11	4.66
Xylene (mixed isomers)	2.4E-03	2.9E-02	1.17 lbs/yr	0.125	0.03	0.05	1.38

As demonstrated in the table above, the emissions from the storage tanks are insignificant in accordance with 15 NCAC 2D .0503(8).

D. Sanding Operation:
- IES-01SD

1. Description:
This is a sanding shop used to depaint aerospace components prior to repair for helicopter blades and other aircraft parts.

2. Applicable Regulatory Requirements:
The Aerospace manufacturing and rework facilities that depaint six or less completed aerospace vehicles in a calendar year are exempt from the requirements of this NESHAP under 40 CDR 63.746(c). Therefore the proposed sanding shop is not subject to the provisions for depainting operations of Subpart GG.

The particulate generator rate and capture efficiency are conservatively assumed to be 7.8 grams/minute (1.03 lb/hr) and 96%, respectively. These values are taken from "Comparative Emissions of Random Orbital Sanding between Conventional and Self-Generated Vacuum Systems" for conventional sanding of chromate painted steel panels. It has been assumed that is sanding booth will be equipped with nanofiber filters with a control efficiency range of 98-99%; the control efficiency has conservatively been assumed to be 98%

Potential annual emissions of chromium compounds were determined by assigning a commonly used material coating to the aircraft component using the generation rate and capture described efficiency.

Usage Rates, Generation Rates, and Efficiencies estimates:
Daily Usage Rate = 4.8 hours
Annual Usage Rate = 1200 hours
Assumed Particulate Generation Rate = 7.80 grams/minute
Assumed Collection Efficiency = 96%
Assumed Filter Efficiency = 98%

CAS#	Compound					Category	Weight Fraction	Emissions	Emissions
Criteria Pollutants								lbs/day	tons/yr
PM	Particulate Matter					--------	1.00	0.10	0.01
PM10	Particulate Matter (less than 10µ)					--------	1.00	0.10	0.01
Metals		TAP	HAP	VOC	PM				
BioCR6	Strontium Chromate (7789-06-2)	Y	Y	----	Y	BioCR6	0.28	0.03	6.57
NSCR6	Barium Chromate (10294-40-3)	Y	Y	----	Y	NSCR6	0.01	0.001	0.25
SolCR6	Soluble Chromium (VI) compounds	Y	Y	----	Y	SolCR6	----------	----------	---------

Example calculation (PM):

(Generation rate) x (60 minutes/hour) x (1 lbs/453.59 grams) x (Weight fraction) x (Capture Efficiency) x (1-Control Efficiency)

As demonstrated in the table above, the emissions from the storage tanks are insignificant in accordance with 15 NCAC 2D .0503(8).

E. Composting Operation:
- IES-02CM

1. Description:
This operation will potentially process 374 tons of material per year, converting yard waste and food waste to humus. The modular system is composed of three vessels, each with a capacity 40 cubic yards. Fort Bragg intends to co-compost food waste with green yard waste (mulch, yard debris, etc.). The three-vessel system is expected to turnover once every 28 days.

2. Applicable Regulatory Requirements:
Emission factors for the co-composting operation are taken from the California South Coast Air Quality Management District's guidance on co-composting and the California Air Resources Board guidance on estimating green house gas emissions from composting operations.

Bulk densities for food waste and green waste are taken from EPA's "Life Cycle Inventory and Cost Model for Mixed Municipal and Yard Waste Composting"(July 2000), table 6. Fort Bragg estimated the compost stream to be 75% green waste and 25% food waste.

Bulk Densities:
Yard Waste = 122 lb/yd^3
Food Waste = 594 lbs/yd^3

The emission factor for VOC and ammonia for the co-composting operation are taken from the South Coast Air Quality Management District's "Technology Assessment For Proposed Rule 1133: Emission Reductions From Composting and Related Operations" (March 22, 2002), Table 2-3 and the "Final Staff Report for Proposed Rule 1133-Composting and Related Operations-General Administrative Requirements" (January 10, 2003). Emission factors for methane and nitrous oxide for composting are taken from the California Air Resources Board "Method for Estimating Greenhouse Gas Emission Reductions from Compost from Commercial Organic Waste", Table 3.

The biofilter control rates for each pollutant are taken from Engineered Compost System (ECS) Technical Bulletin 145-3, "A Cost-Effective Method for Controlling Compost Air Emissions", Table 2.

Control Efficiencies:
VOC = 98%
Ammonia = 100%
Methane = 99%
N_2O = 97%

Throughput = 374 tons per year

CAS#	Compound			Emission Factor	Annual Emissions
VOC	Volatile Organic Compounds			1.78 lbs/ton mix	0.01 tons/yr
Organic Compounds		TAP	HAP		lbs/yr
7664-41-7	Ammonia	Yes	No	2.93 lbs/ton mix	
CH_4	Methane	No	No	8.20 lbs/ton mix	30.70 lbs/yr
N_2O	Nitrous oxide	No	No	0.18 lbs/ton mix	2.02 lbs/yr

As demonstrated in the table above, the emissions from the storage tanks are insignificant in accordance with 15 NCAC 2D .0503(8).

VII. The application was signed by an authorized official as defined by 15A NCAC 2Q .0304(j).

VIII. An air toxics review and evaluation is triggered with the addition of the combustion sources (boilers, hot water heaters, engines).

A toxic air pollutant evaluation is required for this facility because of the recent regulatory (15A NCAC 2Q .0701, .0702, .0706 and .0709) change (effective July 10, 2010) to remove the exemption to exclude combustion sources as emitters of toxic air pollutants. However, because the engines at this facility are subject to MACT Subpart ZZZZ and the boilers and other indirect fired hot water heaters are subject to the Boiler MACT (Subpart DDDDD), these sources will be evaluated in accordance with G.S. 143-215.107.

General Statute G.S. 143-215.107(a) was approved on June 28, 2012. This Act exempts from State Air Toxics those sources of emissions that are subject to certain Federal emissions requirements under 40 CFR Part 61 (NESHAP), Part 63 (NESHAP), or Case-by-Case MACT pursuant to 42 U.S.C. §7412(j). This evaluation is done using actual emissions from existing sources and projected actual for new sources. Fort Bragg used the more conservative approach by using potential emissions to perform the evaluation.

The Fort Bragg military base submitted application No. 2600102.12A to the DAQ on December 29, 2011. This application included a facility-wide toxics demonstration and modeling exercise. The modeling results were revised by Fort Bragg (URS consulting) on April 22, 2013 at the request of the DAQ. The facility was modeled as five separate zones, each acting as an independent facility {divided into five zones (A through E)}. As a conservative approach, the facility modeled all pollutants that were greater than 50% of their respective TPER limits. Fort Bragg used AERMOD with regulatory defaults, and with five years of DAQ processed meteorology (Raleigh, 1988-1992) to model the emissions. Adequate receptors were incorporated, along with digital elevation data, to determine maximum impacts, which occurred on or near the property lines. Based on the dispersion modeling results, the model submitted in application 2600102.12A did demonstrate compliance on a source by source basis with the AAL.

The proposed boilers and water heaters at this facility will be permitted to burn either No. 2 fuel oil, propane, or natural gas. The emergency generators will only burn Diesel fuel. All of the fuels were evaluated for toxic air pollutant emissions. The emission rates from this modification were combined with the previous modeling demonstrations and modeled by the applicant.

The current DAQ policy is to exclude hot water heaters less than 240 gallons and comfort heaters less than 0.2 mmBtu/hour heat input in the toxics evaluation.

Toxic emissions from the combustion of Diesel fuel oil in the RICE engines:
These emissions are based on 100% operation on Diesel fuel. The DAQ emission factors from the DAQ website (http://www.daq.state.nc.us/permits/spreadsheets/) were used. For small engines (less than 600 hp), ICE2012 Revision R was used and for large engines (greater than 600 hp), LGD2012 Revision 1 was used.

Toxic emissions from the combustion of fuels in the boilers and indirect-fired hot water heaters:
The DAQ emission factors from the DAQ website (http://www.daq.state.nc.us/permits/spreadsheets/) for boilers

(revision E, 2/1/2010) was used.

A summary of the toxic air emissions from all the boilers, hot water heaters, emergency generators, and tanks in

Application 2600102.13A is listed in the following Table in this review.

Compound	TAP	HAP	Zone A			Zone C			Zone D		
			lbs/yr	lbs/day	lbs/hr	lbs/yr	lbs/day	lbs/hr	lbs/yr	lbs/day	lbs/hr
1,3-Butdiene	Y	Y	0.01	----------	----------	----------	----------	----------	----------	----------	----------
Acrolein	Y	Y	----------	----------	0.00	----------	----------	----------	----------	----------	----------
Benzene	Y	Y	9.48	----------	----------	----------	----------	----------	3.31	----------	----------

Cresol (mixed isomers)	Y	Y	----------	----------	0.00	----------	----------	----------	----------	----------	----------
Chromium VI	Y	Y	----------	----------	----------	0.05	----------	----------	----------	----------	----------
Formaldehyde	Y	Y	----------	----------	----------	----------	----------	----------	----------	----------	----------
Hexane	Y	Y		0.68	----------	----------	----------	----------	----------	----------	----------
Phenol	Y	Y	----------	----------	----------	----------	----------	----------	----------	----------	----------
Styrene	Y	Y	----------	----------	----------	----------	----------	----------	----------	----------	----------
Toluene	Y	Y		0.16	0.01	0.35	----------	0.04	----------	----------	----------
Xylene	Y	Y	----------	0.11	0.00	----------	----------	----------	----------	----------	----------
Arsenic	Y	Y	0.09	----------	----------	----------	----------	----------	----------	----------	----------
Beryllium	Y	Y	0.05	----------	----------	----------	----------	----------	----------	----------	----------
Cadmium	Y	Y	0.20	----------	----------	----------	----------	----------	----------	----------	----------
Manganese	Y	Y		0.00	----------	----------	----------	----------	----------	----------	----------
Mercury & Compounds	Y	Y		0.00	----------	----------	----------	----------	----------	----------	----------
Nickel	Y	Y		0.00	----------	----------	----------	----------	----------	----------	----------
Strontium chromate	Y	Y	----------	----------	----------	1.68	----------	----------	----------	----------	----------

Notes for Table:
1. Boiler lbs/year based on 8760 hours per year operation
2. Daily emissions based on annual lbs/year divided by 365 days.
3. Hourly emissions based on annual lbs/year divided by 8760 hours.
4. Generator emissions based on 500 hours per year maximum operation.

Zone	Averaging Period	Compound	% of AAL (based potential to emit instead of actual emissions except for Chromium VI)
A	Hourly	Phenol	20.32%
A	Daily	Hydrogen Sulfide	67.76%
A	Annual	Non-Specific Chromium Compounds	41.64%
B	Hourly	Phenol	44.45%
B	Annual	Bioavailable Chromate Pigments, as Chromium VI Equivalent	34.58%
B	Annual	Non-Specific Chromium VI Compounds, as Chromium VI Equivalent	95.20%
C	Hourly	Acrolein	27.86%
C	Hourly	Formaldehyde	98.54%
C	Annual	Bioavailable Chromate Pigments, as Chromium VI Equivalent	23.65%
C	Annual	Bioavailable Chromate Pigments, as Chromium VI Equivalent	30.65%
D	Annual	Non-Specific Chromium VI Compounds, as Chromium VI Equivalent	0.07%

The emission rates of toxic air pollutants from the proposed modifications at the Fort Bragg military facility in Cumberland County have been reviewed by the DAQ. As stated earlier in this review, Fort Bragg modeled facility wide for the toxic air pollutants at this facility. This revision (T39) included an emissions analysis and maps of the locations of the proposed permitted sources. The proposed new sources in this application (2600102.13A) are to be located in Zones A, C, and D. The potential emissions from the proposed sources were added to the total emissions modeled in the most recent toxic air pollutant analysis and evaluated against their respective AAL values for the appropriate averaging periods.

A facility-wide modeling effort was submitted in applications 2600102.12A, 2600102.12B, and 2600102.12C were performed using potential emissions from the existing and new sources except for non-specific Chromium VI (in application 2600102.12C). Due to the conservatism of this modeling effort, the output results are much higher than would be expected if the modeling was performed based on actual emissions, as allowed by the DAQ.

The North Carolina Division of Air Quality's air toxics program is a "risk-based" regulatory program designed to protect the public health by limiting emissions of toxic air pollutants from man-made sources. Air toxic pollutants emitted from this facility were evaluated using dispersion modeling. The model did demonstrate compliance on a source by source basis with the AAL. The DAQ has concluded that the addition of the proposed sources in application 2600102.13A will not present an unacceptable risk to human health based on dispersion modeling.

IX. Public Notice:
This application will go through the 30 day public notice and 45 day EPA review when the Permittee re-submits this application within one year of operation of the new sources.

X. NonAttainment:
Fort Bragg Army Post is located in Cumberland County. The current Section 107 attainment status designations for areas within the state of North Carolina are summarized in 40 CFR 81.334. Cumberland County is classified as “better than national standards” for total suspended particulates (TSP, also referred to as Particulate Matter, PM, which includes particulate matter less than 10 microns, PM10) and for sulfur dioxide (SO_2). Cumberland County is designated as “unclassifiable/attainment” for carbon monoxide (CO), PM2.5 and 1-hour standard for ozone. Cumberland County is designated as “cannot be classified or better than national standards” for nitrogen dioxide (NO_2). Cumberland County is designated as “attainment” for the 8-hour standard for ozone.

XI. This facility is subject to 15A NCAC 2Q .0508(g) “Prevention of Accidental Releases”. Fort Bragg submitted its Risk Management Plan (RMP) in 06/01/1999. The plan was revised in 2004 and 2010.

XII. For PSD Increment tracking purposes, the PSD Minor Source Baseline date was triggered in Cumberland County for particulate matter and SO_2 on July 26, 1978 and for NOx on August 20, 2001. The addition of the new sources in applications 2600102.13A will increase particulate matter, sulfur dioxide, and nitrogen oxide emissions.

The potential emissions of all the proposed sources were added together for increment tracking purposes. All of the engines are subject to NSPS Subpart IIII, therefore NSPS allowable exhaust emission rates were used as the worse case emissions rates for the calculations for PM10 and NOx. AP-42 was used for SO_2 emissions calculation since the NSPS does not have an allowable emissions rate for this pollutant.

<u>Example Calculation for generators:</u>
NSPS allowable emission rate for NOx = 6.4 g/kW-hr
NSPS allowable emission rate for PM10 = 0.2 g/kW-hr
AP-42 emission factor for SO_2 = 1.21E-01 lbs/hp-hr

<u>Nitrogen Oxide/Sulfur dioxide/PM10 emissions for ES-100G, 101G, 184GI, 185GI, and 186GI:</u>
The total combined kW rating for all of the proposed generators is: (750 + 1230 + 450 + 42 + 35 = 2507 kW).
The total combined hp rating for all of the proposed generators is: (1005.8 + 1649.5 + 603.5 + 56.3 + 46.9 = 3362 hp).+

$$\left[\frac{6.4\text{ g NOx}}{\text{kW}-\text{hour}}\times 2507\text{ kW}\times\frac{1\text{ lbs NOx}}{453.59\text{ g}}\right]=\frac{33.37\ lbs\ \text{NOx}}{\text{hour}}$$

$$\left[\frac{0.2\text{ g PM10}}{\text{kW}-\text{hour}}\times 2507\ kW\times\frac{1\text{ lbs }PM10}{453.59\text{ g}}\right]=\frac{1.1\,lbs\ PM10}{\text{hour}}$$

$$\left[\frac{1.21\text{E}^{-}01\text{ g }SO_2}{\text{hp-hour}}\times 3362\ hp\times\frac{1\text{ lbs }PM10}{453.59\text{ g}}\right]=\frac{0.9\,lbs\,SO_2}{\text{hour}}$$

The DAQ spread sheet for boilers was used to calculate the emissions from the boilers and indirect fired heaters firing No. 2 fuel oil (@ 0.35 mmBtu per hour total heat input) and from the boilers and indirect fired water heaters firing natural gas (@ 20.7 mmBtu per hour total heat input).

Maximum hourly emissions for PSD increment tracking purposes from the total modification:

Pollutant	Emergency Generators	No. 2 fuel oil-fired boiler @ 0.35 mmBtu/hr	Natural gas-fired boilers & indirect fired heaters @ 20.7 mmBtu/hr	Total Emissions
NOx	33.37 lbs/hr	0.05 lbs/hr	2.03 lbs/hr	35.45 lbs/hr
PM10	1.1 lbs/hr	0	0.15 lbs/hr	1.25 lbs/hr
SO_2	0.9 lbs/hr	0.18 lbs/hr	0.01 lbs/hr	1.09 lbs/hr

For PSD increment tracking purposes, the NOx emission rate is increased by 35.45 pounds per hour, the SO_2 emission rate is increased by 1.09 pounds per hour, and the PM_{10} emissions rate is increased by 1.25 pounds per hour.

XIII. The permit review and draft permit were sent to the Fayetteville Regional office and the applicant on January 17, 2014. Fort Bragg responded with comments on January 23, 2014.

XIV. Recommendations

This modification issued under section 15A NCAC 2Q .0501(c)(2) for XVII Airborne Corps and Fort Bragg, located in Fort Bragg, Cumberland County, North Carolina, has been reviewed by the DAQ to determine compliance with all procedures and requirements. The DAQ has determined that this facility is complying or will achieve compliance as specified in the permit with all applicable requirements. The Fayetteville Regional Office concurs.

Issue permit No. 04379T39

ATTACHMENT E

NORTH CAROLINA DIVISION OF AIR QUALITY Air Permit Review – Significant Modification processed in accordance with 15A NCAC 2Q .0501(c)(1) Permit Issue Date: October 28, 2013	Region: Fayetteville Regional Office County: Cumberland NC Facility ID: 2600102 Inspector's Name: Robert Hayden Date of Last Inspection: 01/24/2013 Compliance Code: 3 / Compliance - inspection
Facility Data Applicant (Facility's Name): HQ XVIII ABN Corps & Fort Bragg Facility Address: HQ XVIII ABN Corps & Fort Bragg Director of Public Works Fort Bragg, NC 28310 SIC: 9711 / National Security NAICS: 92811 / National Security Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V	Permit Applicability (this application only) SIP: 15A NCAC 2D .0503, 2D .0516, 2D .0521, 2D .0524, and 2D .1111, 2Q .0702(18) NSPS: Subpart IIII NESHAP: Subpart ZZZZ, Subpart DDDDD PSD: N/A PSD Avoidance: Will be evaluated for each project and funding code. 112(r): N/A Other: N/A NC Toxics: A toxics evaluation will be performed in accordance with G.S. 143-215.107(a); Boilers subject to MACT, engines subject to MACT

Contact Data			Application Data
Facility Contact Gary Cullen Air Program Manager IMSE-BRG-PWE-C 2175 Reilly Rd., Stop A Ft Bragg, NC 28310 (910) 432-8464 gary.l.cullen4.civ@mail.mil	Authorized Contact Gregory Bean Director of PWBC IMSE-BRG-PWE, Bldg 2175 Reilly Rd., Stop A Fort Bragg, NC 28310 (910) 396-4009	Technical Contact Gary Cullen Air Program Manager IMSE-BRG-PWE 2175 Reilly Rd., Stop A Ft Bragg, NC 28310 (910) 432-8464 gary.l.cullen4.civ@mail.mil	Application Numbers: 2600102.12B Date Received: July 2, 2012 Application Type: Modification Application Schedule: TV-Sign-501(c)(1) Existing Permit Data Existing Permit Number: 04379T37 Existing Permit Issue Date: July 29, 2013 Existing Permit Expiration Date: 09/30/2016

Consultant: URS Group Inc.	Contact: Gary Cullen	Phone: (910) 432-8464	email: gary.l.cullen4@mail.mil
	Contact: Leslie Pearce	Phone: (919) 461-1471	email: leslie.pearce@urs.com

Review Engineer: Booker Pullen Regional Engineer: Robert Hayden Review Engineer's Signature: Begin Date: July 8, 2013	Comments / Recommendations: Issue: 04379T38 Permit Issue Date: October 28, 2013 Permit Expiration Date: 09/30/2016

I. Introduction/Description:

Fort Bragg Army Post is home to both the 82nd Airborne Division and the XVIII Airborne Corps Headquarters. Additionally, Fort Bragg hosts the U. S. Army Special Operations Command, the U. S. Army Parachute Team (the Golden Knights), FORSCOM, and U. S. Army Reserve. The Fort Bragg Military Base is located at 2175 Reilly Road, Stop A, Cumberland County, Fort Bragg, North Carolina. Application No. 2600102.12B was received by the Raleigh Central Office, Division of Air Quality (DAQ) on November 27, 2012. The application was considered complete on that date. The application was amended on May 9, 2013. This facility is requesting a "Significant" modification {processed in accordance with 15A NCAC 2Q .0501 (c)(1)} in this application. This permit modification is required to go through a 30-day public notice and a 45 day EPA review at this time.

II. Purpose of the amendment submitted on May 9, 2012 for Application 2600102.12B:

A. To withdraw the request for the "placeholder units" (future units to be installed at the facility that did not currently have defined geographic locations) submitted in the initial application.

B. Request the installation of additional units with defined locations and equipment specifications included in the initial application.

C. Administrative amendments:

1. Changed building number of IES-02W to building 251.

2. Remove MACT Subpart DDDDD applicability from units that do not meet the definition of a boiler or process heater and remove applicability for hot water heaters below the volume threshold of Subpart DDDDD that were permitted in Revision T37.
   a. ES-613B, 614B, 623B, 624B, 625B, 630B through 633B, 634B through 636B, 645B, and 655B through 658B.

D. Equipment to be added or removed:
1. Small natural gas-fired and/or fuel oil-fired boilers and water heaters at various locations on the Base.
2. Remove Diesel-fired emergency generators from various locations on the Base, remove IES-14W.
3. Add natural gas-fired makeup air unit.
4. Add natural gas-fired infrared heaters.
5. Add two non-destructive inspection (NDI) operations (IES-04N and 05N).
6. Add one above ground storage tank (IES-16T12825).
7. Removed waste water treatment plant and wood working operation.

III. The modifications to the Fort Bragg Title V Air Permit will include the following separate projects as listed in 2600102.12B (includes Amendment received on May 9, 2013):

ID Number	Building/Description	Project No.	Description
Boilers, hot water heaters, infrared heaters			
ES-642B	241	FA42001-1	0.15 mmBtu/hr, natural gas, hot water boiler
ES-643B	249	FA42001-1	1.08 mmBtu/hr, natural gas, hot water boiler
ES-644B	250	FA42001-1	1.08 mmBtu/hr, natural gas, hot water boiler
IES-00BI645B	2-7606	FA50017-9P	1.0 mmBtu/hr , natural gas, heater
ES-646B	82nd HQ	PN44968	1.5 mmBtu/hr, natural gas, hot water boiler
ES-647B	O-1900M; SOTF-North CUP	PN66315	3.5 mmBtu/hr, natural gas/No. 2 fuel oil, boiler
ES-648B	O-1900M; SOTF-North CUP	PN66315	3.5 mmBtu/hr, natural gas/No. 2 fuel oil, boiler
ES-649B	O-1900M; SOTF-North CUP	PN66315	0.6 mmBtu/hr, natural gas/No. 2 fuel oil, boiler
ES-650B	O-1900M; SOTF-North CUP	PN66315	2.09 mmBtu/hr, natural gas/No. 2 fuel oil, boiler
ES-651B	3rd BCT Complex, BHQ	PN64342	0.4 mmBtu/hr, natural gas, hot water boiler
ES-652B	3rd BCT Complex, BHQ	PN64342	0.5 mmBtu/hr, natural gas, hot water boiler
ES-653B	Sky Warrior UAS COF	PN69835	0.45 mmBtu/hr, natural gas, hot water heater
ES-654B	Sky Warrior UAS COF	PN69835	0.199 mmBtu/hr, natural gas water heater (400 gallon)
IES-00BI655B	Sky Warrior UAS Hangar	PN69835	0.9 mmBtu/hr, natural gas, infrared heater
IES-00BI656B	Sky Warrior UAS Hangar	PN69835	0.9 mmBtu/hr, natural gas, infrared heater
IES-00BI657B	Sky Warrior UAS Hangar	PN69835	0.9 mmBtu/hr, natural gas, infrared heater
IES-00BI658B	Sky Warrior UAS Hangar	PN69835	0.9 mmBtu/hr, natural gas, infrared heater
ES-659B	Sky Warrior UAS Hangar	PN69835	0.5 mmBtu/hr, natural gas, water heater (1250 gallon)
ES-660B	Sky Warrior UAS Hangar	PN69835	0.5 mmBtu/hr, natural gas, water heater (1250 gallon)
ES-661B	Sky Warrior UAS Hangar	PN69835	0.45 mmBtu/hr, natural gas, boiler
ES-662B	Sky Warrior UAS Hangar	PN69835	0.45 mmBtu/hr, natural gas, boiler
ES-663B	SOF Ops Communications Facility-JSOC JCU	PN66444	3.0 mmBtu/hr, natural gas, boiler
ES-664B	3-2245B	SC00010-1P	0.56 mmBtu/hr, N. 2 fuel oil, boiler
ES-665B	241, Pope ACT	None	0.15 mmBtu/hr, natural gas-fired boiler
ES-666B	241, Pope ACT	None	0.15 mmBtu/hr, natural gas-fired boiler
ES-667B	12336, BOQ	None	0.40 mmBtu/hr, natural gas-fired boiler
ES-668B	12334, BOQ	None	0.40 mmBtu/hr, natural gas-fired boiler
ES-669B	12334, BOQ	None	0.40 mmBtu/hr, natural gas-fired hot water heater (200 gallons)
ES-670B	12732, BOQ	None	0.40 mmBtu/hr, natural gas-fired boiler
ES-671B	22411	None	0.34 mmBtu/hr, natural gas-fired boiler
ES-672B	UAV TEMF	None	1.3 mmBtu/hr, natural gas-fired boiler
ES-673B	SOF Battalion Ops/3rd SFG	None	1.5 mmBtu/hr, natural gas-fired boiler
ES-674B	SOF Battalion Ops/3rd SFG	None	1.5 mmBtu/hr, natural gas-fired boiler

ES-675B	SOF Battalion Ops/3rd SFG	None	1.35 mmBtu/hr, natural gas-fired hot water heater
ES-676B	SOF Battalion Ops/3rd SFG	None	1.35 mmBtu/hr, natural gas-fired hot water heater
ES-677B	SOF Battalion Ops/3rd SFG	None	1.35 mmBtu/hr, natural gas-fired hot water heater
ES-678B	SOF Battalion Ops/3rd SFG	None	1.35 mmBtu/hr, natural gas-fired hot water heater
ES-679B	SOF Communications Training Facility	None	0.4 mmBtu/hr, natural gas-fired hot water heater (500 gallons)
ES-680B	SOF Communications Training Facility	None	0.4 mmBtu/hr, natural gas-fired hot water heater (500 gallons)
ES-681B	SOF Communications Training Facility	None	0.4 mmBtu/hr, natural gas-fired boiler
ES-682B	SOF Communications Training Facility	None	0.4 mmBtu/hr, natural gas-fired boiler
ES-683B	Murray and McNair ES School replacement	None	1.5 mmBtu/hr, natural gas-fired boiler
ES-684B	Murray and McNair ES School replacement	None	1.5 mmBtu/hr, natural gas-fired boiler
ES-685B	Murray and McNair ES School replacement	None	0.3 mmBtu/hr, natural gas-fired hot water heater (140 gallons)
ES-686B	Murray and McNair ES School replacement	None	0.3 mmBtu/hr, natural gas-fired hot water heater (140 gallons)
ES-687B	Murray and McNair ES School replacement	None	0.2 mmBtu/hr, natural gas-fired hot water heater (140 gallons)
ES-688B	C-130 Flight Simulator	None	0.2 mmBtu/hr, natural gas-fired boiler
ES-689B	C-130 Flight Simulator	None	0.1 mmBtu/hr, natural gas-fired boiler
ES-690B	General Purpose Storage Building	None	0.5 mmBtu/hr, natural gas-fired boiler
IES-00BI63	A5245, 3rd BCT COF	None	0.75 mmBtu/hr, natural gas-fired boiler
IES-00BI64	A5245, 3rd BCT COF	None	0.75 mmBtu/hr, natural gas-fired boiler
IES-00BI65	A5245, 3rd BCT COF	None	0.65 mmBtu/hr, natural gas-fired hot water heater
IES-00BI66	Z3252	None	1.4 mmBtu/hr, natural gas-fired dehumidifier/ emergency heater
IES-00BI67	UAV TEMF	None	0.12 mmBtu/hr, natural gas-fired hot water heater
IES-00BI68	UAV TEMF	None	0.12 mmBtu/hr, natural gas-fired hot water heater
IES-00BI69	UAV TEMF	None	0.03 mmBtu/hr, natural gas-fired, direct-fired htr.
IES-00BI70	UAV TEMF	None	0.03 mmBtu/hr, natural gas-fired, direct-fired heater
IES-00BI71	UAV TEMF	None	0.03 mmBtu/hr, natural gas-fired, direct-fired htr.
IES-00BI72	UAV TEMF	None	0.03 mmBtu/hr, natural gas-fired, direct-fired heater
IES-00BI73	UAV TEMF	None	0.03 mmBtu/hr, natural gas-fired, direct-fired heater
IES-00BI74	C1736	None	0.083 mmBtu/hr, natural gas-fired hot water heater (125 gallons)
IES-00BI75	Murray and McNair ES School Replacement	None	0.4 mmBtu/hr, natural gas-fired makeup air unit
IES-00BI76	289, Barracks	None	0.04 mmBtu/hr, hot water heater (50 gallons)
Generators			
ES-99G	J6, ATF, Communications Bldg	SC00008-2P	1250 kW, Diesel-fired emergency generator
ES-100G	3-1441	SC00012-2P	800 kW, Diesel-fired emergency generator
ES-160GI	3-2141	SC00009-2P	450 kW, Diesel-fired emergency generator
ES-161GI	NEC 346	13MP	125 kW, Diesel-fired emergency generator
ES-162GI	ACP-SOTF (Pass Office)	PN69277	150 kW, Diesel-fired emergency generator
ES-163GI	ACP-SOFT (Overwatch Bldg)	PN69277	150 kW, Diesel-fired emergency generator
ES-164GI	O-9075	W904TE-10-M-0832	125 kW, Diesel-fired emergency generator

ES-165GI	O-9002	W904TE-10-M-0832	75 kW, Diesel-fired emergency generator
IES-16T12825	813	BRAC	420,000 JP-8 AST
IES-05N	731	BRAC	NDI Operation
IES-04N	P3262	N/A	NDI Operation

Changes to existing permit per application 2600102.12B:

Old Page No.	New Page No.	Condition No.	Changes
Cover Letter			
Page 1	Page 1	Heading and body of letter	Revised issue date, changed permit revision number, changed "complete application" received date,
Page 2	Page 2	Heading and body of letter	Revised issued date at the top of letter, and changed the effective date of permit, added NOx, SO_2 and PM10 hourly contributions for the addition of the new sources in this application
Page 3	Page 3	"Changes to Permit" Table	Updated the table to reflect the changes per this modification
Insignificant Activities List			
N/A	Page 1 of 5	Table of Sources	Removed IES-01WW, removed IES-07WO
Page 2 of 4	Page 2 of 5		Removed IES-01N, added IES-16T12825, IES-04N, and IES-05N
Page 3 of 4	Page 3 of 5		Changed building number for IES-02W, removed IES-07W, IES-11W, and IES-14W
N/A	Page 4 of 5		Added: IES-00BI66 through 00BI74
N/A	Page 5 of 5		Added: IES-00BI75, IES-00BI76, IES-00BI630 through 00BI636, IES-00BI645, and IES-00BI655 through 00BI658,
Body of the Permit			
Page 1	Page 1	Cover Page	Changed: effective date of permit, issue date, revision number, application number, received date of application, "replaces permit" number
Page 3	Page 3	Table of Permitted Sources	Removed boilers ES-22B and ES-23B from permit. Added low NOx burner description to boilers ES-01CMA, 02CMA, and 03CMA.
Page 4	Page 4		Added "low NOx burner description to ES-44B, 45B, and 46B, changed heat input to 0.5 million Btu per hour for ES-607 and ES-608. Changed heat input rating to 0.5 mmBtu per hour for boilers ES-607B and ES-608B. Removed MACT DDDDD applicability from ES-613B and 614B.
N/A	Page 5		Changed heat input rating for boiler ES-642B to 0.15 mmBtu per hour heat input. Added boilers ES-642B through ES-644B, ES-646B through ES-654B, ES-659B, and ES-660B. Removed MACT DDDDD applicability from ES-624B and 625B, and ES-630B through 636B.
N/A	Page 6		Added boilers ES-661B through ES-683B
N/A	Page 7		Added boilers ES-684B through ES-690B
Page 11	Page 11		Added generators ES-99G and ES-100G. Removed generators ES-7GI, ES-50GI, ES-57GI, ES-79GI, and ES-82GI.
Page 12	N/A		Removed generator ES-103GI.
Page 14	N/A		Removed generators 131GI, 136GI, and ES-151GI.
N/A	Page 20		Added low NOx burner description to boilers ES-01CMA, 02CMA, and 03CMA.
N/A			Added generators ES-160GI through 165GI
Pages 24-25	N/A		Removed boilers ES-22B and ES-23B, including regulatory language from permit.
N/A	Page 45		Added low NOx burner description to boilers ES-44B, 45B, and 46B.
Page 47	N/A		Removed ES-7GI
Page 48	N/A		Removed ES-79GI, ES-82GI, ES-50GI, and ES-57GI
Page 49	N/A		Removed ES-131GI, ES-136GI, and ES-103GI
Page 50	N/A		Removed ES-151GI
Page 75	N/A		Removed ES-131GI, ES-136GI, and ES-57GI
Page 78	N/A		Removed ES-79GI and ES-82GI
Page 79	N/A		Removed ES-151GI, added ES-160GI through ES-165GI
Page 80	N/A		Removed ES-7GI and ES-103GI

Page 81	N/A		Removed ES-151GI, added ES-99G and ES-100G
Page 86	N/A		Removed ES-7GI, ES-79GI, and ES-82GI, ES-99G, ES-100G.
Page 87	N/A		Removed ES-151GI, added ES-160GI through ES-165GI

V. Statement of Compliance:
The DAQ has reviewed the compliance status of this facility. Mr. Robert Hayden of the FRO, performed a facility inspection on January 24, 2013 and the facility appeared to be in compliance with all applicable requirements.

VI. Source-by Source Evaluation for Modification Revision T38:

A. Emergency generators:
- ES-99G (Diesel fuel-fired emergency generator, 1250 kW)
- ES-100G (Diesel fuel-fired emergency generator, 800 kW)
- ES-160GI (Diesel fuel-fired emergency generator, 450 kW)
- ES-161GI (Diesel fuel-fired emergency generator, 125 kW)
- ES-162GI (Diesel fuel-fired emergency generator, 150 kW)
- ES-163GI (Diesel fuel-fired emergency generator, 150 kW)
- ES-164GI (Diesel fuel-fired emergency generator, 125 kW)
- ES-165GI (Diesel fuel-fired emergency generator, 75 kW)

1. Description:
All of the emergency generators are fired by Diesel fuel only. For potential emission calculations, 500 maximum hours of operation were used per the 1995 EPA guidance from John S. Seitz, Director of the Office of Air Quality Planning and Standards. The emission of pollutants from each generator unit is uncontrolled.

2. Applicable Regulatory Requirements: This facility has already triggered a facility wide toxics evaluation and has performed modeling which was submitted in application 2600102.12A and 12B. Under the current regulatory requirements, new combustion sources will be evaluated for toxic air pollutants in accordance with G.S. 143-215.107.

All of the emergency generator engines in this application are subject to NSPS (Subpart IIII), and MACT (Subpart ZZZZ). Subpart ZZZZ was revised, and re-published in the Federal Register on January 18, 2008 with an effective date of March 18, 2008. This revision included engines with capacities greater than 500 brake horsepower and engines with capacities less than 500 brake horsepower located at major sources of HAP emissions.

<u>40 CFR Part 60, New Source Performance Standard, Subpart IIII:</u>

- Per 40 CFR §60.4200(a) NSPS, Subpart IIII does apply to these emergency generators because of their manufacture date.

<u>40 CFR Part 63, Maximum Achievable Control Technology, Subpart ZZZZ (for engines less than 500 bhp):</u>

- Per 40 CFR §63.6590(a)(2)(ii), a stationary RICE with a site rating of equal to or less than 500 brake hp located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12, 2006. A stationary RICE with a site rating of more than 500 brake hp located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after December 19, 2002.

- Per 40 CFR §63.6590(c)(6) "Stationary RICE Subject Regulations under 40 CFR Part 60" a new compression ignition emergency generator with a site rating <u>less than 500</u> brake horsepower located at a major source of HAP emissions <u>can meet</u> the requirements of Subpart ZZZZ by meeting the requirements of NSPS Subpart IIII. No further requirements apply for such engines under this part.

<u>40 CFR Part 63, Maximum Achievable Control Technology, Subpart ZZZZ (for engines greater than 500 bhp):</u>

- Per 40 CFR §63.6600(c), and applicant that operates stationary emergency RICE with a site rating of

more than 500 brake HP located at a major source of HAP emissions, does not need to comply with the emission limitations in Tables 1a, 2a, 2c, and 2d to this subpart or operating limitations in Tables 1b and 2b to this Subpart.

The following provides a summary of limits and/or standards for the emission sources described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Visible emissions	20 percent opacity	15A NCAC 2D .0521
Sulfur dioxide	Burn fuel that contains less than 15 parts per million sulfur content	15A NCAC 2D .0524 40 CFR Part 60 Subpart IIII
Hazardous Air Pollutants	Meet the requirements of NSPS Subpart IIII for emergency units less than 500 hp • ES-160GI • ES-161GI • ES-162GI • ES-163GI • ES-164GI • ES-165GI Meet requirements of 40 CFR 63.6640(f) for emergency units greater than 500 hp • ES-99G • ES-100G	15A NCAC 2D .1111 40 CFR Part 63, Subpart ZZZZ
NMHC + NOx, HC, NOx, CO, PM	For emergency engines: Purchase engine certified to meet the applicable engine design emission limits	15A NCAC 2D .0524 40 CFR Part 60 Subpart IIII
Toxic air pollutants	Evaluation required	15A NCAC 2Q .0702(18) G.S. 143-215.107

a. 15A NCAC 2D .0521"Control Of Visible Emissions"

Regulation Analysis:

i. Generators will be installed after July 1, 1971, and each is therefore subject to the State regulation 15A NCAC 2D .0521(d). Per this regulation visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute periods averaging more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period for each boiler.

Compliance is expected with this regulation because all of the generators will be firing diesel fuel.

Monitoring/Recordkeeping/Reporting [15A NCAC 2Q .0508(f)]

ii. No monitoring, recordkeeping, or reporting is required for visible emissions from the firing of diesel fuel in any engine because it should always be in compliance with the opacity standard during normal operation.

b. 15A NCAC 2D .1111, 40 CFR Part 63, Subpart ZZZZ: National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines

i. General Provisions [40 CFR §63.6665]:
The Permittee shall comply with the requirements of 40 CFR part 63 Subpart A "General provisions," according to the applicability of Subpart A to such sources, as identified in Table No. 8 in Subpart ZZZZ, "Applicability of General Provisions to Subpart ZZZZ".

ii. Compliance/Notification Procedures [40 CFR §63.6645]
Per 40 CFR §63.6590(c) "Stationary RICE Subject Regulations Under 40 CFR Part 60", new

emergency compression ignition generators less than 500 brake horsepower site rating must only meet the requirements of NSPS, Subpart IIII. Per 40 CFR §63.6600(c), and applicant that operates stationary emergency RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, does not need to comply with the emission limitations in Tables 1a, 2a, 2c, and 2d to this subpart or operating limitations in Tables 1b and 2b to this Subpart.

iii. Recordkeeping Requirement For Applicability Determination [40 CFR §63.10(b)(3)]
The applicability determination for exclusion of the emergency generators from the requirements of 40 CFR Part 63, Subpart ZZZZ and Subpart A of this part, shall be maintained on site for a period of 5 years after the determination, or until the source changes its operations to become an affected source, whichever comes first. The analyses, or other information, that demonstrates the exemption from the requirements of Subpart ZZZZ and part A of this subpart, shall be signed by the person making the determination.

iv. Monitoring/Reporting [15A NCAC 2Q .0508(f)]
- Owner/operators who purchase an emergency generator that is less that 30 liters per cylinder must purchase units that are certified by the manufacturer to meet the applicable engine design emission limits. {§60.4211 (c)}.
- Owners/operators must operate and maintain engines and control devices in accordance with the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the life of the engine. {§60.4206 and §60.4211 (a)}.
- No testing is required for units less than 30 liter per cylinder displacement that have been certified by the manufacturer to meet design limits.
- Install a nonresettable hour meter {§60.4209(a)}.

c. 15A NCAC 2D .0524: NEW SOURCE PERFORMANCE STANDARDS, SUBPART IIII

Applicability [15A NCAC 2Q .0508(f), 40 CFR 60.4200(a)(2(i))]

i. For each engine, the Permittee shall comply with all applicable provisions, including the requirements for emission standards, notification, testing, reporting, record keeping, and monitoring, contained in Environmental Management Commission Standard 15A NCAC 2D .0524 "New Source Performance Standards (NSPS)" as promulgated in 40 CFR Part 60 Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines," including Subpart A "General Provisions."

General Provisions [15A NCAC 2Q .0508(f)]

ii. Pursuant to 40 CFR 60 .4218, The Permittee shall comply with the General Provisions of 40 CFR 60 Subpart A as presented in Table 8 of 40 CFR 60 Subpart IIII.

Emission Standards [15A NCAC 2Q .0508(f)]

iii. The Permittee shall comply with the emission standards for new non-road CI engines in 40 CFR 60.4202, for all pollutants, for the same model year and maximum engine power for this source. [40CFR 60.4205(b)]

Fuel Requirements [15A NCAC 2Q .0508(f)]

iv. The Permittee shall use diesel fuel in the engine with:
i. a maximum sulfur content of 15 ppm; and
ii. a minimum cetane index of 40 or a maximum aromatic content of 35 volume percent.
[40CFR 60.4207(b) and 40CFR 80.510(b)]

Testing [15A NCAC 2Q .0508(f)]

v. If emission testing is required, the testing shall be performed in accordance with General Condition JJ. If the results of this test are above the limits given in above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524.

Monitoring [15A NCAC 2Q .0508(f)]

vi. The engine has the following monitoring requirements:
(A) The engine shall be equipped with a non-resettable hour meter prior to startup. [40CFR 60.4209(a)]
(B) The engine, if equipped with a diesel particulate filter, must be installed with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached. [40CFR 60.4209(b)]

Compliance Requirements [15A NCAC 2Q .0508(b)]

vii. The Permittee shall:
(A) Operate and maintain the engines and control devices according to the manufacturer's emission related-written instructions over the entire life of the engine;
(B) Change only those emission-related settings that are permitted by the manufacturer; and
(C) Meet the requirements of 40 CFR 89, 94 and/or 1068 as applicable.
[40CFR 60.4206 and 60.4211(a)]

viii. The Permittee shall comply with the emission standards for emergency generators by purchasing an engine certified to the emission standards in condition c. The engine shall be installed and configured according to the manufacturer's emission-related specifications. [40CFR 60.4211(c)]

ix. Emergency stationary ICE may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. There is no time limit on the use of emergency stationary ICE in emergency situations. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. Emergency stationary ICE may operate up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply non-emergency power as part of a financial arrangement with another entity. For owners and operators of emergency engines, any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as permitted in this section, is prohibited.
[40CFR 60.4211(f)]

The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524, if the requirements in the conditions listed above in this section.

Recordkeeping [15A NCAC 2Q .0508(f)]

x. To assure compliance, the Permittee shall perform inspections and maintenance on the engine as recommended by the manufacturer per 40 CFR 60.4206 and 40 CFR 60.4211(a). The results of inspection and maintenance shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request. The logbook shall record the following:
(A) the date and time of each recorded action;
(B) the results of each inspection;
(C) the results of any maintenance performed on the engine;
(D) any variance from manufacturer's recommendations, if any, and corrections made;
(E) the hours of operation of the engine in emergency and non-emergency service. [40 CFR60.4214(b)]

(F) If a PM filter is used, records of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit of the engine is approached [40 CFR60.4214(c)]; and
(G) Documentation from the manufacturer that the engine is certified to meet the emission standards in condition c.

The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524 if these records are not maintained.

Reporting [15A NCAC 2Q .0508(f)]

xi. The Permittee shall submit a summary report of monitoring and recordkeeping activities postmarked on or before January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period between January and June. All instances of noncompliance with the requirements of this permit shall be clearly identified.

d.The following PSD evaluation is for the individual projects that involve the installation of Diesel fuel fired emergency generators. Fort Bragg is a PSD major source for criteria pollutants. Modifications are evaluated against the PSD major source significance levels according to individual projects.

The Diesel fuel-fired engines will emit CO, NOx, PM, PM10, PM2.5, SO_2, VOCs, and GHGs. All of the proposed engines will be subject to NSPS Subpart IIII and are therefore required to meet the limitations in this Subpart for CO, NOx, PM10, and VOCs.

Pollutant	Major Source Significance level
GHGs	75,000 tpy
PM	25 tpy
PM10	15 tpy
PM2.5	10 tpy
SO_2	40 tpy
VOCs	40 tpy
CO	100 tpy
NOx	40 tpy

The individual project (SC00008-2P) for the installation of one Diesel fuel-fired emergency generator (ES-99G, 1250 kW) represents the project with the largest emission rate of criteria pollutants. These emissions however do not exceed the PSD significance threshold levels when operating at a maximum 500 hours per year.

The example calculation was made using the following data:

- Using 500 hour per year maximum operation for emergency generator ES-99G
- Maximum kW rating = 1250 kW
- NOx = 6.4 g/kW-hr (NSPS Subpart IIII, 40 CFR 89.112 emission limit prior to year 2014)
- CO = 3.5 g/kW-hr (NSPS Subpart IIII, 40 CFR 89.112 emission limit prior to year 2014)
- PM/PM10 = 0.2 g/kW-hr (NSPS Subpart IIII, 40 CFR 89.112 emission limit prior to year 2014)
- PM2.5 = 7.0E-04 lbs/hp-hour (DAQ spread sheet)
- SO_2 = 4.05E-03 lbs/hp-hour (DAQ spread sheet)
- VOCs = 6.42E-04 lbs/hp-hour (DAQ spread sheet)

From 40 CFR Part 98, "Mandatory Green House Gas Reporting", Tables C-1 and C-2)

- Emission factor for No. 2 fuel oil = 73.96 kg CO_2/mmBtu
- Emission factor for No. 2 fuel oil = 3.0E-03 kg CH_4/mmBtu
- Emission factor for No. 2 fuel oil = 6.0E-04 kg N_2O/mmBtu

Globing Warming Potentials from 40 CFR Part 98, A-1 (CO_2 equivalence)

- CO_2 = 1
- CH_4 = 21

- N_2O = 310

GHGs (CO_2, CH_4, N_2O):
Fort Bragg is a major PSD source for GHG emissions (> 100,000 tpy). The GHG emission factors were taken from 40 CFR Part 98 "Mandatory Greenhouse Gas Reporting", Subpart C, Table C-2 for Petroleum fuel types. The total GHG emission rate from the SC00008-2P project is less than 75,000 tons per year (at 480 tpy CO_{2e}) threshold. Therefore, no PSD avoidance condition for GHGs is required. *See example calculations below.*

GHG:s:
In accordance with EPA's AP-42 Chapter 3.3 (Table 3.3-1; Reference a), an average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr was used to convert from lb/mmBtu to lb/hp-hr when necessary. GHGs (CO_{2e}) are less than the PSD significance level (75,000 tpy)

$$\frac{1250\ kW}{engine} \times \frac{1.341\ hp}{1\ kW} \times = \frac{1676.3\ hp}{engine}$$

$$\frac{73.96\ kg\ CO_2}{1\times10^6\ Btu} \times \frac{1000\ g}{kg} \times \frac{1\ lb}{453.59\ g} \times \frac{7000\ Btu}{hp-hr} \times \frac{1676.3\ hp}{1} \times \frac{1\ ton}{2000\ lbs} \times \frac{500\ hrs}{year} \times \frac{1\ tons\ CO_{2e}}{1\ ton\ CO_2} = \frac{478.3\ tons\ CO_{2e}}{year}$$

$$\frac{3.0E-03\ kg\ CH_4}{1\times10^6\ Btu} \times \frac{1000\ g}{kg} \times \frac{1\ lb}{453.59\ g} \times \frac{7000\ Btu}{hp-hr} \times \frac{1676.3\ hp}{1} \times \frac{1\ ton}{2000\ lbs} \times \frac{500\ hrs}{year} \times \frac{21\ tons\ CO_{2e}}{1\ ton\ CO_2} = \frac{0.42\ tons\ CO_{2e}}{year}$$

$$\frac{6.0E-04\ kg\ N_2O}{1\times10^6\ Btu} \times \frac{1000\ g}{kg} \times \frac{1\ lb}{453.59\ g} \times \frac{7000\ Btu}{hp-hr} \times \frac{1676.3\ hp}{1} \times \frac{1\ ton}{2000\ lbs} \times \frac{500\ hrs}{year} \times \frac{310\ tons\ CO_{2e}}{1\ ton\ CO_2} = \frac{1.2\ tons\ CO_{2e}}{year}$$

Total CO_2e burning No. 2 fuel oil (Diesel fuel) = 478.3 + 0.42 + 1.2 = 480 tons CO_2e per year total.

NOx emissions from project SC00008-2P:
NOx emissions (4.4 tpy at 500 hrs/yr) are less than the 40 tpy significance level.

$$\frac{6.4\ g\ NOx}{kW-hr} \times \frac{1\ lbs\ NOx}{453.59\ g} \times \frac{1250\ kW}{1} \times \frac{1\ \text{ton NOx}}{2000\ \text{lbs NOx}} \times \frac{500\ \text{hrs}}{\text{year}} = \frac{4.4\ \text{tons NOx}}{\text{year}}$$

PM/PM10 emissions from project SC00008-2P:
PM emissions (0.14 tpy at 500 hrs/yr) are less than the 25 tpy significance level and PM10 emissions (0.29 tpy at 500 hrs/yr) are less than the 15 tpy significance level.

$$\frac{0.20\ g\ PM\ /\ PM10}{kW-hr} \times \frac{1\ lbs\ PM\ /\ PM10}{453.59\ g} \times \frac{1250\ kW}{1} \times \frac{1\ \text{ton}\ PM\ /\ PM10}{2000\ \text{lbs}\ PM\ /\ PM10} \times \frac{500\ \text{hrs}}{\text{year}} = \frac{0.14\ \text{tons}\ PM\ /\ PM10}{\text{year}}$$

PM2.5 emissions from project SC00008-2P:
PM2.5 emissions (0.29 tpy at 8760 hrs/yr) are less than the 10 tpy significance level.

$$\frac{7.0E-04\ lbs\ PM2.5}{hp-hr} \times 1676.3\ hp \times \frac{1\ \text{ton}\ PM2.5}{2000\ \text{lbs}\ PM2.5} \times \frac{500\ \text{hrs}}{\text{year}} = \frac{0.29\ \text{tons}\ PM2.5}{\text{year}}$$

SO_2 for peak shaving unit:
NSPS Subpart IIII does not have an emission limit for SO, but it does require that all Diesel fuel fired in the engines contain less than 0.15% by weight sulfur. The SO_2 emission factor used is from AP-42, table 3.4-1 (greater than 600 hp) was corrected to 15% sulfur by weight. SO_2 emissions (0.51 tpy at 500 hrs/yr) are less than the 40 tpy significance level.

$$\left[\frac{8.09\text{E-}03\ lbs\ SO_2 \times 0.15}{\text{hp-hour}} \times 1676.3\ hp \times\right] \times \frac{1\ \text{ton}}{2000\ \text{lbs}} \times \frac{500\ \text{hrs}}{\text{year}} = \frac{0.51\ \text{tons}\ SO_2}{\text{year}}$$

CO emissions from project SC00008-2P:
CO emissions (3.23 tpy at 500 hrs/yr) are less than the 100 tpy significance level.

$$\frac{3.5\ g\ CO}{kW-hr} \times \frac{1\ lbs\ CO}{453.59\ g} \times \frac{1676.3\ kW}{1} \times \frac{1\ \text{ton}\ CO}{2000\ CO} \times \frac{500\ \text{hrs}}{\text{year}} = \frac{3.23\ \text{tons}\ CO}{\text{year}}$$

VOCs emissions from project SC00008-2P:
NSPS Subpart IIII does not have a separate emission limit for VOCs for this model year generator. The VOC emission factor used is from DAQ spread sheet (greater than 600 hp). VOC emissions (0.27 tpy at 500 hrs/yr) are less than the 40 tpy significance level.

$$\frac{6.42E-04\ lbs\ VOC}{hp-hr} \times \frac{1676.3\ hp}{1} \times \frac{1\ \text{ton}\ VOC}{2000\ \text{lbs}\ VOC} \times \frac{500\ \text{hrs}}{\text{year}} = \frac{0.27\ \text{tons}\ VOC}{\text{year}}$$

B. The boilers, indirect-fired hot water heaters, and hot water boilers listed in Sections III., Table 1 of this review. The heat input from all of the applicable units will be reviewed in accordance with 15A NCAC 2D .0503.

5. Description: All of the boilers, hot water heaters, hot water boilers, and infrared heaters at Fort Bragg are used for domestic purposes only and not to heat water for a production process. Historically the Division of Air Quality has permitted comfort heat boilers at military bases and universities because of the size and the large number of boilers. The units at military bases are usually funded separately under a variety of projects and are therefore evaluated by the separately funded projects. The boilers, and water heaters are subject to the Boiler MACT and will be listed in the body of the permit.

6. Applicable Regulatory Requirements: These small boilers are placed into the body of the permit because they are subject to the boiler MACT. These are new boilers, but NSPS Subpart Dc does not apply because each of the units is less than 10 million Btu per hour heat input. These boilers will be evaluated for toxic air pollutants in accordance with G.S. 143-215.107(a).

   ES-645B (natural gas-fired heater), and ES-655B through ES-658B (infrared heaters) do not meet the definition of boiler or process heater under the boiler MACT.

   15A NCAC 2D .1111 "Boiler MACT, Subpart DDDDD" will apply to the boilers in this modification because they will commence construction after June 4, 2010. Boilers and process heaters in the units designed to burn gas 1 fuels (natural gas) subcategory with a heat input capacity of less than or equal to 5 million Btu per hour must complete a tune-up every 5 years as specified in § 63.7540. Boilers and process heaters in the units designed to burn gas 1 fuels subcategory with a heat input capacity greater than 5 million Btu per hour and less than 10 million Btu per hour must complete a tune-up every 2 years as specified in § 63.7540. Boilers and process heaters in the units designed to burn gas 1 fuels subcategory are not subject to the emission limits in Tables 1 and 2 or 11 through 13 to this subpart, or the operating limits in Table 4 to this subpart [40 CFR 63.7500(e)]. This regulation does not apply to hot water heaters that are heated by gaseous or liquid fuel with a capacity of no more than 120 US gallon capacity.

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Particulate matter	0.18 lbs per million Btu heat input	15A NCAC 2D .0503
Sulfur dioxide	2.3 pounds per million Btu heat input	15A NCAC 2D .0516
Visible emissions	20 percent opacity	15A NCAC 2D .0521
Toxic air pollutants	Evaluation required by the DAQ	G.S. 143-215.107

HAPS	Work practice standards	15A NCAC 2D .1111 Subpart DDDDD

Because these boilers are not subject to NSPS Subpart Dc (heat inputs less than 10 million Btu per hour), particulate emission rates will have allowable emission rates in accordance with 15A NCAC 2D .0503 (e). Per this regulation, the maximum heat input shall be the total heat content of all fuels that are burned in a fuel burning indirect heat exchanger, of which the combustion products are emitted through a stack or stacks. The sum of maximum heat input of all fuel burning indirect heat exchangers at a plant site that are in operation, under construction, or permitted pursuant to 15A NCAC 2Q, shall be considered as the total heat input for the purpose of determining the allowable emission limit for particulate matter for each fuel burning indirect heat exchanger.

Fuel burning indirect heat exchangers constructed or permitted after February 1, 1983, shall not change the allowable emission limit of any fuel burning indirect heat exchanger whose allowable emission limit has previously been set.

The removal of a fuel burning indirect heat exchanger shall not change the allowable emission limit of any fuel burning indirect heat exchanger whose allowable emission limit has previously been established. However, for any fuel burning indirect heat exchanger constructed after, or in conjunction with, the removal of another fuel burning indirect heat exchanger at the plant site, the maximum heat input of the removed fuel burning indirect heat exchanger shall no longer be considered in the determination of the allowable emission limit of any fuel burning indirect heat exchanger constructed after or in conjunction with the removal.

a. 15A NCAC 2D .0503: PARTICULATES FROM FUEL BURNING INDIRECT HEAT EXCHANGERS
   v. Emissions of particulate matter from the combustion of natural gas that are discharged from these sources into the atmosphere shall not exceed 0.18 pounds per million Btu heat input. [15A NCAC 2D .0503(a)]

Table 2 Heat input values for boilers currently permitted at Fort Bragg and the new boilers per application (2600102.12B):

ID No.	Heat input (mmBtu/hr)	Type of fuel	Description	Project
Boilers, and water heaters currently at facility	1015.86 mm/Btu hr total at the facility as of revision T37	Natural gas, No. 2 fuel oil, recycled No. 2 fuel oil, Diesel fuel	Various combustion devices	----------
ES-642B	0.15 mmBtu/hr	Natural gas	Hot water boiler	FA42001-1
ES-643B	1.08 mmBtu/hr	Natural gas	Hot water boiler	
ES-644B	1.08 mmBtu/hr	Natural gas	Hot water boiler	
ES-646B	1.5 mmBtu/hr	Natural gas	Hot water boiler	PN44968
ES-647B	3.5 mmBtu/hr	Natural gas/No. 2 f.o.	Boiler	PN66315
ES-648B	3.5 mmBtu/hr	Natural gas/No. 2 f.o.	Boiler	
ES-649B	0.6 mmBtu/hr	Natural gas/No. 2 f.o.	Water heater (400 gal)	
ES-650B	2.09 mmBtu/hr	Natural gas/No. 2 f.o.	Boiler	
ES-651B	0.4 mmBtu/hr	Natural gas	Hot water boiler	PN64342
ES-652B	0.5 mmBtu/hr	Natural gas	Hot water boiler	
ES-653B	0.45 mmBtu/hr	Natural gas	Hot water boiler	PN69835
ES-654B	0.199 mmBtu/hr	Natural gas	Water heater (400 gal)	
ES-659B	0.5 mmBtu/hr	Natural gas	Water heater (1250 gal)	
ES-660B	0.5 mmBtu/hr	Natural gas	Water heater (1250 gal)	
ES-661B	0.45 mmBtu/hr	Natural gas	Boiler	
ES-662B	0.45 mmBtu/hr	Natural gas	Boiler	

ID No.	Heat input (mmBtu/hr)	Type of fuel	Description	Project
ES-663B	3.0 mmBtu/hr	Natural gas	Boiler	PN66444
ES-664B	0.56 mmBtu/hr	No. 2 f. o.	Boiler	SC00010-1P

ES-665B	0.15 mmBtu/hr	Natural gas	Boiler	----------
ES-666B	0.15 mmBtu/hr	Natural gas	Boiler	----------
ES-667B	0.4 mmBtu/hr	Natural gas	Boiler	----------
ES-668B	0.4 mmBtu/hr	Natural gas	Boiler	----------
ES-669B	0.4 mmBtu/hr	Natural gas	Hot water heater (200 gal)	----------
ES-670B	0.4 mmBtu/hr	Natural gas	Boiler	----------
ES-671B	0.34 mmBtu/hr	Natural gas	Boiler	----------
ES-672B	1.3 mmBtu/hr	Natural gas	Boiler	----------
ES-673B	1.5 mmBtu/hr	Natural gas	Boiler	----------
ES-674B	1.5 mmBtu/hr	Natural gas	Boiler	----------
ES-675B	1.35 mmBtu/hr	Natural gas	Hot water heater	----------
ES-676B	1.35 mmBtu/hr	Natural gas	Hot water heater	----------
ES-677B	1.35 mmBtu/hr	Natural gas	Hot water heater	----------
ES-678B	1.35 mmBtu/hr	Natural gas	Hot water heater	----------
ES-679B	0.4 mmBtu/hr	Natural gas	Hot water heater (500 gal)	----------
ES-680B	0.4 mmBtu/hr	Natural gas	Hot water heater (500 gal)	----------
ES-681B	0.4 mmBtu/hr	Natural gas	Boiler	----------
ES-682B	0.4 mmBtu/hr	Natural gas	Boiler	----------
ES-683B	1.5 mmBtu/hr	Natural gas	Boiler	----------
ES-684B	1.5 mmBtu/hr	Natural gas	Boiler	----------
ES-685B	0.3 mmBtu/hr	Natural gas	Hot water heater (140 gal)	----------
ES-686B	0.3 mmBtu/hr	Natural gas	Hot water heater (140 gal)	----------
ES-687B	0.2 mmBtu/hr	Natural gas	Hot water heater (140 gal)	----------
ES-688B	0.2 mmBtu/hr	Natural gas	Boiler	----------
ES-689B	0.2 mmBtu/hr	Natural gas	Boiler	----------
ES-690B	0.5 mmBtu/hr	Natural gas	Boiler	----------
IES-00BI63	0.75 mmBtu/hr	Natural gas	Boiler	----------
IES-00BI64	0.75 mmBtu/hr	Natural gas	Boiler	----------
IES-00BI65	0.65 mmBtu/hr	Natural gas	Hot water heater	----------
IES-00BI67	0.12 mmBtu/hr	Natural gas	Hot water heater	----------
IES-00BI68	0.12 mmBtu/hr	Natural gas	Hot water heater	----------
IES-00BI74	0.083 mmBtu/hr	Natural gas	Hot water heater (125 gal)	----------
IES-00BI76	0.04 mmBtu/hr	Natural gas	Hot water heater (50 gal)	----------
Total for this modification = 41.26 mmBtu/hr				
Remove boilers ES-640B, ES-641B, ES-22B, and ES-23B = - 26.7 mmBtu/hr				
Total heat input at the facility = 1015.86 + 41.26 – 0.75 - 0.75 – 12.6 – 12.6 = 1031.2 mmBtu/hr heat input				

$E = 1.090 \times Q^{-0.2594}$ Where: E = allowable PM emission rate in lbs/mmBtu heat input
Q = maximum heat input rate in million Btu per hour

$E = 1.090 \times Q^{-0.2594}$
$E = 1.090 \times (1030.2)^{-0.2594}$
$E_{allow} = 0.18$ pounds PM per million Btu heat input

The particulate matter emission rate from the burning of natural gas and/or No. 2 fuel oil in any boiler was estimated using AP-42 factors, Supplement E, revised 9/98, a heating value of 1020 Btu per cubic foot of natural gas.

$$\frac{7.6\ lbs PM}{10^6\ cubic\ feet} \times \frac{1\ cubic\ foot\ natural gas}{1020\ Btu} \times \frac{10^6\ Btu}{million Btu} = \frac{0.0074\ lbs PM}{million Btu}$$

$$\frac{2.38\ lbs PM}{10^3\ gallons No.2\ fuel oil} \times \frac{1\ gallon No.2\ fuel oil}{141{,}000\ Btu} \times \frac{10^6\ Btu}{million Btu} = \frac{0.017\ lbs PM}{million Btu}$$

Compliance is indicated when any of the boilers burn natural gas or No. 2 fuel oil, since the actual emission rate is less than the allowable emission rate (0.18 lbs PM per million Btu heat input).

Testing [15A NCAC 2D .0501(c)(3)]

ii. If emission testing is required, the testing shall be performed in accordance General Condition JJ located in Section 3 of the Air Permit. If the results of this test are above the limit given above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0503.

Monitoring [15A NCAC 2Q .0508(f)]

iii. No monitoring, recordkeeping, or reporting is required for particulate emissions from the firing of natural gas and/or No. 2 fuel oil in any boiler or heater.

b. 15A NCAC 2D .0516: SULFUR DIOXIDE EMISSIONS FROM COMBUSTION SOURCES

i. Emissions of sulfur dioxide from these sources shall not exceed 2.3 pounds per million Btu heat input. Sulfur dioxide formed by the combustion of sulfur in fuels, wastes, ores, and other substances shall be included when determining compliance with this standard. [15A NCAC 02D .0516]

Testing [15A NCAC 2D .2601]

ii. If emission testing is required, the testing shall be performed in accordance with 15A NCAC 2D .2601 and General Condition JJ found in Section 3 of the Permit. If the results of this test are above the limit given above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0516.

AP-42 emission factor for natural gas = 0.6 lbs SO_2/mmcf
AP-42 emission factor for no. 2 fuel oil with (0.5% by weight S) = 71 lbs SO_2/1000 gallons

$$\frac{0.6\ lbs\ SO_2}{10^6\ cubic\ \ feet\ \ natural\ \ gas} \times \frac{1\ cubic\ \ foot\ \ natural\ \ gas}{1020\ Btu} \times \frac{10^6\ Btu}{million\ \ Btu} = 0.00058\ \frac{lbs\ PM}{million\ \ Btu}$$

$$\frac{71.0\ lbs\ SO_2}{10^3\ gallons\ \ No.\ 2\ \ fuel\ \ oil} \times \frac{1\ gallon\ \ No.\ 2\ \ fuel\ \ oil}{141{,}000\ Btu} \times \frac{10^6\ Btu}{million\ \ Btu} = \frac{0.5\ lbs\ SO_2}{million\ \ Btu}$$

Compliance is indicated when any boiler or heater burns natural gas or No. 2 fuel oil since the actual emission rate is less than the allowable emission rate (2.3 lbs SO_2 per million Btu heat input).

Monitoring/Recordkeeping [15A NCAC 2Q .0508(f) and 15A NCAC 2D .2601]

v. No monitoring, recordkeeping, or reporting is required for sulfur dioxide emissions from the firing of natural gas or No. 2 fuel oil in any boiler or heater.

c. 15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS

i. Visible emissions from any of the natural gas-fired and/or No. 2 fuel oil fired units shall not be more than 20 percent opacity when averaged over a six-minute period. However, six-minute averaging periods may exceed 20 percent not more than once in any hour and not more than four times in any 24-hour period. In no event shall the six-minute average exceed 87 percent opacity. [15A NCAC 02D .0521 (d)]

Testing [15A NCAC 02D .2601]

ii. If emission testing is required, the testing shall be performed in accordance with 15A NCAC 2D .2601 and General Condition JJ. If the results of this test are above the limit given above, the Permittee shall be deemed in noncompliance with 15A NCAC 02D .0521.

iii. Monitoring/Recordkeeping/Reporting [15A NCAC 02Q .0508(f)]

No monitoring, recordkeeping, or reporting is required for visible emissions from the firing of natural gas and/or No. 2 fuel oil in any boiler or water heater.

d. PSD Evaluation for the boilers in application 2600102.12B:
Due to the operational tempo and structure of this military facility, projects are frequently initiated and funded separately by various different tenants who all fall under the ownership of Fort Brag Army Post. These projects are appropriated separately by Congress, the emissions are calculated separately for each funding code, and evaluated independently against the PSD major modification thresholds.

The Addendum to application 2600102.12B received by the DAQ on May 9, 2013 included some additional boilers. No project number was assigned to the individual boilers in this addendum, therefore the entire group was considered to be one project for calculation purposes. This represented the largest project in the application. The combined heat input (20.57 mmBtu per hour) for the boilers/hot water heaters (ES-665B through 690, and IES-00BI63 through 76) firing natural gas only was used in the following calculations. The DAQ spread sheet (http://www.daq.state.nc.us/permits/spreadsheets/), Revision K, 6/19/2012 was used.

Total heat input = 20.57 mmBtu per hour
Fuel = natural gas
Uncontrolled

Pollutant	NOx	VOCs	PM	PM10	PM2.5	GHGs	SO_2	CO
Value	8.83 tpy	0.49 tpy	0.67 tpy	0.67 tpy	0.67 tpy	10,541.63 tpy (CO_{2e})	0.05 tpy	7.42 tpy
PSD Threshold	40 tpy	40 tpy	25 tpy	15 tpy	10 tpy	75,000 tpy	40 tpy	100 tpy

The PSD threshold is not exceeded for any criteria pollutant.

C. Storage Tank:
- IES-16T12825 (Aboveground storage tank, 420,000 gallon capacity, JP-8 fuel)

1. Description: This tank stores fuel that is used in equipment at the Fort Bragg facility.

2. Applicable Regulatory Requirements: This source will be permitted in accordance with 15A NCAC 2D .0503(8) and added to the insignificant activities list. Emissions were calculated in Appendix B of the application and estimated to be less than five tons per year and HAPs less than 1000 lbs per year.

Storage tank emissions are calculated using emission factor developed from TANKs 4.09 for each tank. The factors are then applied using the fuel speciation. The equations listed below demonstrate how emissions were calculated for each tank.

Emission Calculations for Storage Tank Surrogates
Speciated emission factors: Weight Fraction x EF
Annual Emissions (lb/yr) = Vapor Weight Fraction x (Standing Losses (lbs/yr) + Working Losses (lbs/yr)
Standing Losses (lbs/yr) = S_LOSS Emission Factor {(lbs/hr-gal)} x Actual Storage Volume of Tank (gal) x 8760 (hrs/yr)
Working Losses (lbs/yr) = W_LOSS Emission Factor (lb/gal) x Potential Tank Throughput (gal) (assumed to be 10 turnovers per year)

Tank Number	Tanks Results		Emission Factors	
	S_LOSS (lbs/yr)	W_LOSS (lbs/yr)	S_LOSS EF [lbs/hr-gal)]	W_LOSS EF (lbs/gal)
IES-16T12825	361.37	135.76	9.82E-08	3.23E-05

1) The weather data for Raleigh was used as it is the geographically closest city in TANKS4.09.

2) For TANKS4.09 runs, all tanks were assumed to be in good working condition and were entered with a color or shade of gray/light.

The following table has the vapor weight fraction of gasoline. These vapor weight fractions are applied to the derived emissions factors from the TANKS4.09 results to develop an emission factor for each compound.

The product of the standing loss emission factor, the total capacity of the tank, 8760 hours/yr operation, and the vapor weight fraction, are used to calculate the standing loss emissions for each tank.

The product of the working loss emission factor, the potential tank throughput, and the vapor weight fraction are used to calculate the working loss emission for each tank.

Table (Storage Tank)

Compound	Gasoline Vapor Weight Fraction	Emissions from IES-16T12825
Volatile Organic Compounds	1.00	0.249 tpy
2,3,4-Trimethylpentane	9.5E-03	4.74 lbs/yr
Benzene	6.3E-03	3.11 lbs/yr
Cresol (mixed isomers)	6.5E-06	0.003 lbs/yr
Cumene	1.7E-04	0.083 lbs/yr
Ethylbenzene	6.3E-04	0.314 lbs/yr
Methyl Tert Butyl Ether	3.6E-02	18.0 lbs/yr
Naphthelene	5.5E-06	0.003 lbs/yr
N-Hexane	4.4E-02	22.0 lbs/yr
Phenol	1.1E-06	0.001 lbs/yr
Styrene	8.8E-04	0.438 lbs/yr
Toluene	8.4E-03	4.19 lbs/yr
Xylene (mixed isomers)	2.4E-03	1.17 lbs/yr

As demonstrated in the table above, the emissions from the storage tanks are insignificant in accordance with 15 NCAC 2D .0503(8).

D. Non-Destructive inspection:
- IES-04N
- IES-05N

1. Description:
These operations use special detection materials to coat equipment in order to visualize very small structural fractures.

2. Applicable Regulatory Requirements:
The emissions from this type of operation are calculated using a mass balance, in which it is assumed that 100% of the volatile components of these materials are emitted during the application process. The materials used are HAP/TAP free, and the resulting emissions are below the significant threshold for permitting a codified in 15A NCAC 2D .0503(8).

Usage Information:

Building	ID No.	MSDS Date	Product Description	Manufacturer	CY 2011 usage (gal/yr)
P3262	IES-04N	01/10/10	Ultagel II Ultrasonic Couplant	Sonotech, Inc.	5.00
		04/16/10	Zyglo Penetrant Inspection	Magnaflux	25.00
		03/29/10	Zyglo Penetrant ZL-27A	Magnaflux	100.00
		03/16/10	Spotcheck Cleaner/Remover	Magnaflux	50.00
731	IES-05N	01/10/10	Ultragel II Ultrasonic Couplant	Sonotech, Inc.	5.00
		04/16/10	Zyglo Penetrant Inspection	Magnaflux	25.00
		03/29/10	Zyglo Penetrant ZL-27A	Magnaflux	100.00

		03/16/10	Spotcheck Cleaner/Remover	Magnaflux	50.00

Emissions Calculations:

ID No.	Product Name	Product Density	VOC Content (wt%)	VOC Density (lbs/gal)	VOC Emissions	
					lbs/yr	tpy
IES-04N	Ultragel II Ultrasonic Couplant	9.00	----------	1.40	7.00	0.004
	Zyglo Penetrant Inspection Developer SKD-S2	7.17	85%	6.09	152.00	0.076
	Zyglo Penetrant ZL-27A	8.01	56%	4.49	449.00	0.224
	Spotcheck Cleaner/ Remover	6.34	100%	6.34	317.00	0.159
IES-05N	Ultragel II Ultrasonic Couplant	9.00	----------	1.40	7.00	0.004
	Zyglo Penetrant Inspection Developer SKD-S2	7.17	85%	6.09	152.00	0.076
	Zyglo Penetrant ZL-27A	8.01	56%	4.49	449.00	0.224
	Spotcheck Cleaner/ Remover	6.34	100%	6.34	317.00	0.159

As demonstrated in the table above, the emissions from the storage tanks are insignificant in accordance with 15 NCAC 2D .0503(8).

VII. The application was signed by an authorized official as defined by 15A NCAC 2Q .0304(j).

VIII. An air toxics review and evaluation is triggered with the addition of the combustion sources (boilers, hot water heaters, engines).

A toxic air pollutant evaluation is required for this facility because of the recent regulatory (15A NCAC 2Q .0701, .0702, .0706 and .0709) change (effective July 10, 2010) to remove the exemption to exclude combustion sources as emitters of toxic air pollutants. However, because the engines at this facility are subject to MACT Subpart ZZZZ and the boilers and other indirect fired heaters are subject to the Boiler MACT, Subpart DDDDD, these sources will be evaluated in accordance with G.S. 143-215.107.

General Statute G.S. 143-215.107(a) was approved on June 28, 2012. This Act exempts from State Air Toxics those sources of emissions that are subject to certain Federal emissions requirements under 40 CFR Part 61 (NESHAP), Part 63 (NESHAP), or Case-by-Case MACT pursuant to 42 U.S.C. §7412(j). This evaluation is done using actual emissions from existing sources and projected actual for new sources. Fort Bragg used the more conservative approach by using potential emissions to perform the evaluation except for the non-specific Chromium VI emissions in Zone B.

The Fort Bragg military base submitted application No. 2600102.12A to the DAQ on December 29, 2011. This application included a facility-wide toxics demonstration and modeling exercise. The modeling results were revised by Fort Bragg (URS consulting) on April 22, 2013 at the request of the DAQ. The facility was modeled as five separate zones, each acting as an independent facility {divided into five zones (A through E)}. As a conservative approach, the facility modeled all pollutants that were greater than 50% of their respective TPER limits. Fort Bragg used AERMOD with regulatory defaults, and with five years of DAQ processed meteorology (Raleigh, 1988-1992) to model the emissions. Adequate receptors were incorporated, along with digital elevation data, to determine maximum impacts, which occurred on or near the property lines. Based on the dispersion modeling results, the model submitted in application 2600102.12A did demonstrate compliance on a source by source basis with the AAL.

The proposed boilers, and water heaters at this facility will be permitted to burn both No. 2 fuel oil and/or natural gas. The emergency generators will only burn Diesel fuel. All of the fuels were evaluated for toxic air

pollutant emissions. The emission rates from this modification were combined with the previous modeling demonstrations (in applications 2600102.12A and 2600102.12C).

The current DAQ policy is to exclude hot water heaters less than 240 gallons and comfort heaters less than 0.2 mmBtu/hour heat input in the toxics evaluation.

Toxic emissions from the combustion of Diesel fuel oil in the RICE engines:
These emissions are based on 100% operation on Diesel fuel. The DAQ emission factors from the DAQ website (http://www.daq.state.nc.us/permits/spreadsheets/) were used. For small engines (less than 600 hp), ICE2012 Revision R was used and for large engines (greater than 600 hp), LGD2012 Revision 1 was used.

Toxic emissions from the combustion of fuels in the boilers:
The DAQ emission factors from the DAQ website (http://www.daq.state.nc.us/permits/spreadsheets/) for boilers

(revision E, 2/1/2010) was used.

Toxic emissions from the combustion of natural gas in HVAC units, and infrared heaters:
Emission factors from US EPA AP-42 chapter 1.4 "External combustion Sources for Natural gas-fired units" were used.

A summary of the toxic air emissions from all the boilers, heaters, emergency generators, and tank in application 2600102.12B is listed in the following Table in this review.

Compound	TAP	HAP	Zone A – Boilers			Zone A – Generators			Zone A – Tank		
			lbs/yr	lbs/day	lbs/hr	lbs/yr	lbs/day	lbs/hr	lbs/yr	lbs/day	lbs/hr
1,3-Butdiene	Y	Y	----------	----------	----------	0.115	0.006	0.000	----------	----------	----------
Acetaldehyde	Y	Y	----------	----------	----------	2.546	0.122	0.005	----------	----------	----------
Acrolein	Y	Y	----------	----------	----------	0.364	0.017	0.001	----------	----------	----------
Benzene	Y	Y	0.847	0.002	0.000	11.842	0.568	0.024	3.107	0.311	0.007
Cresol (mixed isomers)	Y	Y	----------	----------	----------	----------	----------	----------	0.003	0.000	0.000
Formaldehyde	Y	Y	62.662	0.172	0.007	4.387	0.211	0.009	----------	----------	----------
Hexane	Y	Y	719.639	1.972	0.082	----------	----------	----------	22.023	2.202	0.047
Methyl Chloroform	Y	Y	0.150	0.000	0.000	----------	----------	----------	----------	----------	----------
Phenol	Y	Y	----------	----------	----------	----------	----------	----------	0.001	0.000	0.000
Styrene	Y	Y	----------	----------	----------	----------	----------	----------	0.438	0.044	0.001
Toluene	Y	Y	5.028	0.014	0.001	4.497	0.216	0.009	4.186	0.419	0.009
Xylene	Y	Y	----------	----------	----------	3.101	0.149	0.006	1.168	0.117	0.003
Arsenic	Y	Y	0.423	0.001	0.000	0.059	0.003	0.000	----------	----------	----------
Beryllium	Y	Y	0.273	0.001	0.000	0.044	0.002	0.000	----------	----------	----------
Cadmium	Y	Y	0.619	0.002	0.000	0.044	0.002	0.000	----------	----------	----------
Manganese	Y	Y	0.659	0.002	0.000	0.088	0.004	0.000	----------	----------	----------
Mercury & Compounds	Y	Y	0.352	0.001	0.000	0.044	0.002	0.000	----------	----------	----------
Nickel	Y	Y	0.936	0.003	0.000	0.044	0.002	0.000	----------	----------	----------
Benzo(a)pyrene	Y	Y	0.000	0.000	0.000	0.004	0.000	0.000	----------	----------	----------

Notes for Table:

5. Boiler lbs/year based on 8760 hours per year operation
6. Daily emissions based on annual lbs/year divided by 365 days.
7. Hourly emissions based on annual lbs/year divided by 8760 hours.
8. Generator emissions based on 500 hours per year maximum operation.

Annual averaging period TAPs evaluation					
	Total in Application 12 B & Addendum (lbs/yr)	Total in application 12C (lbs/yr)	Total emission rate increase from 2011 model (lbs/yr)	% increase of model inputs	% AAL based on 2011 modeling
1,3-Butadiene	0.11	0.25	14.64	2.52 %	0.01 %
Benzene	15.80	186.09	670.76	30.10 %	2.52 %
Beryllium	0.32	0.95	19.30	6.56 %	1.12 %
Cadmium	0.66	1.12	29.96	5.94 %	1.28 %

Daily averaging period TAPs evaluation					
	Total in Application 12 B & Addendum (lbs/day)	Total in application 12C (lbs/day)	Total emission rate increase from 2011 model (lbs/day)	% increase of model inputs	% AAL based on 2011 modeling
Hexane	4.17	0.76	106.43	4.63 %	0.14 %
Toluene	0.65	0.55	415.01	0.29 %	0.31 %
Xylene	0.27	0.37	301.54	0.21 %	0.41 %
Manganese	01	1.06	12.96	8.19 %	1.07 %
Mercury & compounds	0.00	0.01	0.14	6.17 %	0.76 %
Nickel	0.00	0.08	1.12	7.87 %	0.41 %

Hourly averaging period TAPs evaluation					
	Total in Application 12 B & Addendum (lbs/hr)	Total in application 12C (lbs/hr)	Total emission rate increase from 2011 model (lbs/hr)	% increase of model inputs	% AAL based on 2011 modeling
Acrolein	0.00	0.00	0.01	23.4 %	0.20 %
Cresol (Mixed Isomers)	0.00	----------	1.85	0.00 %	2.82 %
Formaldehyde	0.02	0.04	0.55	9.76 %	0.54 %
Phenol	0.00	----------	20.09	0.00 %	20.34 %
Styrene	0.00	----------	11.98	0.01 %	1.14 %
Toluene	0.02	0.02	121.20	0.03 %	2.15 %
Xylene	0.01	0.02	89.11	0.03 %	1.39 %

The emission rates of toxic air pollutants from the proposed modifications at the Fort Bragg military facility in Cumberland County have been reviewed by the DAQ. As stated earlier in this review, Fort Bragg modeled facility wide for the toxic air pollutants at this facility. This revision included an emissions analysis and maps of the locations of the proposed permitted sources. All of the proposed new sources in this application are to be located in Zones A. The potential emissions from the proposed sources were added to the total emissions modeled in the most recent toxic air pollutant analysis and evaluated against their respective AAL values for the appropriate averaging periods.

The facility-wide modeling effort that was submitted in applications 2600102.12A, 2600102.12B, and 2600102C were performed using potential emissions from the existing and new sources except for non-specific Chromium VI (in application 2600102.12C). Due to the conservatism of this modeling effort, the output results are much higher than would be expected if the modeling was performed based on actual emissions, as allowed by the DAQ.

The North Carolina Division of Air Quality's air toxics program is a "risk-based" regulatory program designed to protect the public health by limiting emissions of toxic air pollutants from man-made sources. Air toxic

pollutants emitted from this facility were evaluated using dispersion modeling. The model did demonstrate compliance on a source by source basis with the AAL. The DAQ has concluded that the addition of the proposed sources in application 2600102.12B will not present an unacceptable risk to human health based on dispersion modeling.

IX. Public Notice:
A thirty-day public notice is required at this time.

Public notice: The 30-day public notice period was from September 9, 2013 through October 9, 2013. No public comments were received for this permit application.

EPA 45 Day review: The EPA 45-Day review period was from September 9, 2013 through October 24, 2013. No comments were received for this permit application.

X. NonAttainment:
Fort Bragg Army Post is located in Cumberland County. The current Section 107 attainment status designations for areas within the state of North Carolina are summarized in 40 CFR 81.334. Cumberland County is classified as "better than national standards" for total suspended particulates (TSP, also referred to as Particulate Matter, PM, which includes particulate matter less than 10 microns, PM10) and for sulfur dioxide (SO_2). Cumberland County is designated as "unclassifiable/attainment" for carbon monoxide (CO), PM2.5 and 1-hour standard for ozone. Cumberland County is designated as "cannot be classified or better than national standards" for nitrogen dioxide (NO_2). Cumberland County is designated as "attainment" for the 8-hour standard for ozone.

XI. This facility is subject to 15A NCAC 2Q .0508(g) "Prevention of Accidental Releases". Fort Bragg submitted its Risk Management Plan (RMP) in 06/01/1999. The plan was revised in 2004 and 2010.

XII. For PSD Increment tracking purposes, the PSD Minor Source Baseline date was triggered in Cumberland County for particulate matter and SO_2 on July 26, 1978 and for NOx on August 20, 2001. The addition of the new sources in applications 2600102.12B will increase particulate matter, sulfur dioxide, and nitrogen oxide emissions.

The potential emissions have been added together for increment tracking purposes. All of the engines are subject to NSPS Subpart IIII, therefore NSPS allowable exhaust emission rates were used as the worse case emissions rates for the calculations for PM10 and NOx. AP-42 was used for SO_2 emissions calculation since the NSPS does not have an allowable emissions rate for this pollutant.

Example Calculation for generators:
NSPS allowable emission rate for NOx = 6.4 g/kW-hr
NSPS allowable emission rate for PM10 = 0.2 g/kW-hr
AP-42 emission factor for SO_2 = 1.21E-01 lbs/hp-hr

Nitrogen Oxide/Sulfur dioxide/PM10 emissions for ES-99G, 100G, and 160GI through 165GI:
The total combined kW rating for all of the proposed generators is: (1250 + 800 + 450 + 125 + 150 + 150 + 125 + 75 = 3125 kW).

The total combined hp rating for all of the proposed generators is: (4191 hp)

$$\left[\frac{6.4\text{ g NOx}}{\text{kW}-\text{hour}} \times 3125\text{ kW} \times \frac{1\text{ lbs NOx}}{453.59\text{ g}}\right] = \frac{44.09\ lbs\ \text{NOx}}{\text{hour}}$$

$$\left[\frac{0.2\text{ g PM10}}{\text{kW}-\text{hour}} \times 3125\ kW \times \frac{1\text{ lbs }PM10}{453.59\text{ g}}\right] = \frac{1.38\ lbs\ PM10}{\text{hour}}$$

$$\left[\frac{1.21\text{E}^{-}01\text{ g }SO_2}{\text{hp-hour}} \times 4191\ hp \times \frac{1\text{ lbs }PM10}{453.59\text{ g}}\right] = \frac{1.12\ lbs\ SO_2}{\text{hour}}$$

The DAQ spread sheet for boilers was used to calculate the emissions from the boilers and indirect fired heaters firing No. 2 fuel oil (@ 10.25 mmBtu per hour total heat input) and from the boilers and indirect fired heaters firing natural gas (@ 30.71 mmBtu per hour total heat input).

Maximum hourly emissions for PSD increment tracking purposes from the total modification:

Pollutant	Emergency Generators	No. 2 fuel oil-fired boilers & indirect fired heaters @ 10.25 mmBtu/hr	Natural gas-fired boilers & indirect fired heaters @ 30.71 mmBtu/hr	Total Emissions
NOx	44.09 lbs/hr	1.46 lbs/hr	3.01 lbs/hr	48.56 lbs/hr
PM10	1.38 lbs/hr	0.24 lbs/hr	0.23 lbs/hr	1.85 lbs/hr
SO_2	1.12 lbs/hr	5.20 lbs/hr	0.02 lbs/hr	6.34 lbs/hr

For PSD increment tracking purposes, the NOx emission rate is increased by 48.56 pounds per hour, the SO_2 emission rate is increased by 6.34 pounds per hour, and the PM_{10} emissions rate is increased by 1.85 pounds per hour.

XIII. The permit review and draft permit were sent to the Fayetteville Regional office and the applicant on September 6, 2013. Fort Bragg responded with comments prior to the permit being sent to public notice.

XIV. Recommendations

This modification issued under section 15A NCAC 2Q .0501(c)(1) for XVII Airborne Corps and Fort Bragg, located in Fort Bragg, Cumberland County, North Carolina, has been reviewed by the DAQ to determine compliance with all procedures and requirements. The DAQ has determined that this facility is complying or will achieve compliance as specified in the permit with all applicable requirements. The Fayetteville Regional Office concurs.

Issue permit No. 04379T38

ATTACHMENT F

<table>
<tr><td colspan="3">NORTH CAROLINA DIVISION OF AIR QUALITY

Air Permit Review – Significant Modification processed in accordance with 15A NCAC 2Q .0501(c)(1) this review includes an attachment “A” (modeling evaluation)

Permit Issue Date: July 29, 2013</td><td>Region: Fayetteville Regional Office
County: Cumberland
NC Facility ID: 2600102
Inspector’s Name: Robert Hayden
Date of Last Inspection: 01/24/2013
Compliance Code: 3 / Compliance - inspection</td></tr>
<tr><td colspan="3">Facility Data

Applicant (Facility’s Name): HQ XVIII ABN Corps & Fort Bragg

Facility Address:
HQ XVIII ABN Corps & Fort Bragg
Director of Public Works
Fort Bragg, NC 28310

SIC: 9711 / National Security
NAICS: 92811 / National Security

Facility Classification: Before: Title V After: Title V
Fee Classification: Before: Title V After: Title V</td><td>Permit Applicability (this application only)

SIP: 15A NCAC 2D .0503, 2D .0516, 2D .0521, 2D .0524, and 2D .1111, 2Q .0702(18)
NSPS: Subpart IIII
NESHAP: Subpart ZZZZ, Subpart DDDDD
PSD: N/A
PSD Avoidance: Will be evaluated for each project and funding code.
112(r): N/A
Other: N/A
NC Toxics: A toxics evaluation will be performed in accordance with G.S. 143-215.107(a); Boilers subject to MACT, engines subject to MACT</td></tr>
<tr><td colspan="3">Contact Data</td><td rowspan="2">Application Data
Application Numbers: 2600102.12A, 2600102.12C
Date Received: 12/29/2011, and 11/27/2012
Application Type: Modification
Application Schedule: TV-Sign-501(c)(1)

Existing Permit Data
Existing Permit Number: 04379T36
Existing Permit Issue Date: April 26, 2012
Existing Permit Expiration Date: 09/30/2016</td></tr>
<tr><td>Facility Contact
Gary Cullen
Air Program Manager
IMSE-BRG-PWE-C
2175 Reilly Rd., Stop A
Ft Bragg, NC 28310
(910) 432-8464

gary.l.cullen4.civ@mail.mil</td><td>Authorized Contact
Gregory Bean
Director of PWBC
IMSE-BRG-PWE, Bldg
2175 Reilly Rd., Stop A
Fort Bragg, NC 28310
(910) 396-4009</td><td>Technical Contact
Gary Cullen
Air Program Manager
IMSE-BRG-PWE
2175 Reilly Rd., Stop A
Ft Bragg, NC 28310
(910) 432-8464

gary.l.cullen4.civ@mail.mil</td></tr>
<tr><td colspan="4">Consultant: URS Group Inc. Contact: Gary Cullen Phone: W: (910) 432-8464 email: gary.l.cullen4@mail.mil</td></tr>
<tr><td colspan="2">Review Engineer: Booker Pullen
Regional Engineer: Robert Hayden

Review Engineer’s Signature: Begin Date:

November 14, 2012</td><td colspan="2">Comments / Recommendations:
Issue: 04379T37
Permit Issue Date: July 29, 2013
Permit Expiration Date: 09/30/2016</td></tr>
</table>

I. Introduction/Description:

Fort Bragg Army Post is home to both the 82nd Airborne Division and the XVIII Airborne Corps Headquarters. Additionally, Fort Bragg hosts the U. S. Army Special Operations Command, the U. S. Army Parachute Team (the Golden Knights), FORSCOM, and U. S. Army Reserve. The Fort Bragg Military Base is located at 2175 Reilly Road, Stop A, Cumberland County, Fort Bragg, North Carolina. Application No. 2600102.12C was received by the Raleigh Central Office, Division of Air Quality (DAQ) on November 27, 2012. The application was considered complete on that date. This facility is requesting a “Significant” modification {processed in accordance with 15A NCAC 2Q .0501 (c)(1)} in this application.

This permit review serves as the second step of a significant modification for application 2600102.11A and the review of a facility wide toxics evaluation as submitted in application 2600102.12A (considered complete on 12/29/2011). This permit will also include the requested modifications in application 2600102.12C (considered complete on 11/27/2012). This permit modification is required to go through a 30-day public notice and a 45 day EPA review at this time.

II. Purpose of Application 2600102.12A:

A. To fulfill the requirements listed in Section 2.3 “Schedule of Compliance” of the existing permit (revision T36) to conduct a facility-wide toxics evaluation and modeling exercise to include the numerous combustion sources (boilers and generators, etc.) at the Fort Bragg facility.

B. Purpose of Application 2600102.12C:
Fulfill the requirement in the existing permit (Revision T36) to send modified sources through public notice and EPA review and add additional sources as described below.

Due to the operational tempo and structure of a military facility, projects are frequently appropriated separately by the US Congress, projects are separated by each funding code and evaluated independently. The project numbers for each of the proposed pieces of equipment in these applications are shown for the purposes of evaluating pollutant emissions and for PSD.

1. Add small natural gas-fired and/or fuel oil-fired boilers and water heaters at various locations on the Base.
2. Add welding operations.
11. Remove Diesel-fired emergency generators from various locations on the Base.
12. Add one peak shaving/emergency generator unit (ES-17PSG, 2700 kW Diesel fuel-fired).
13. Add Diesel-fired fire pump (ES-ES-17FPO19F2).
14. Add natural gas-fired makeup air units.
15. Add natural gas-fired heating and ventilating units.
16. Add natural gas-fired infrared heaters.
17. Add natural gas heat recovery units.
18. Remove the peak shaving ability from existing engines ES-01PSG through ES-08PSG, ES-10PSG, and ES-16PSG .
19. Remove the Schedule of compliance in Section 2.3. This requirement was fulfilled with application 2600102.12A.

III. The modifications to the Fort Bragg Title V Air Permit will include the following separate projects as listed in 2600102.12C:

Table 1 Changes to the Air Permit per application 2600102.12C

ID Number	Building/Description	Project No.	Description
ES-17PSG	2-5935, Zone A	433-12226	2,700 kW Diesel fuel-fired peak shaving/emergency generator
ES-17FPO19F2	SOTF-Range 16, Zone A	SF00029-0P	54 kW Diesel fuel-fired fire pump engine
ES-181GI	O-9194, ATF, Zone A	SC00008-2P	42 kW Diesel fuel-fired emergency generator
ES-182GI	C-2729, Zone A	PN72136	60 kW Diesel fuel-fired emergency generator
ES-183GI	708, Zone A	PN72136	125 kW Diesel fuel-fired emergency generator
ES-740B	525 MI TEMF, Zone A	PN16992	0.3 mmBtu/hr, Natural gas-fired boiler
ES-741B	525 MI TEMF, Zone A	PN16992	0.4 mmBtu/hr, Natural gas-fired boiler
ES-742B	108th ADA DFAC, Zone A	PN74987	0.5 mmBtu/hr, Natural gas-fired water heater (752 gallons)
ES-743B	108th ADA DFAC, Zone A	PN74987	0.5 mmBtu/hr, Natural gas-fired water heater (752 gallons)
ES-744B	UAV Complex COF, Zone A	PN80112	0.3 mmBtu/hr, Natural gas-fired boiler
ES-745B	UAV Complex COF, Zone A	PN80112	0.3 mmBtu/hr, Natural gas-fired boiler
ES-746B	18TH ABC Battle Command Training Center, Zone B	PN20347	1.5 mmBtu/hr, Natural gas-fired boiler
ES-747B	18TH ABC Battle Command Training Center, Zone B	PN20347	1.5 mmBtu/hr, Natural gas-fired boiler
ES-748B	18TH ABC Battle Command Training Center, Zone B	PN20347	1.5 mmBtu/hr, Natural gas-fired boiler
ES-752B	82nd HQ, Zone A	PN44968	0.25 mmBtu/hr, Natural gas-fired water heater, less than 120 gallons
ES-753B	82nd HQ, Zone A	PN44968	1.5 mmBtu/hr, Natural gas-fired boiler
ES-754B	108th ADA 1-7 TEMF, Zone A	PN67107	0.3 mmBtu/hr, Natural gas-fired water heater
ES-755B	108th Brigade TEMF, Zone A	PN70751	0.25 mmBtu/hr, Natural gas-fired water heater
ES-756B	108th Brigade TEMF, Zone A	PN70751	0.25 mmBtu/hr, Natural gas-fired water heater

Table 1 Changes to the Air Permit per application 2600102.12C (Continued)

ID Number	Building/Description	Project No.	Description
ES-759B	108th ADA DFAC, Zone A	BR67107D	0.5 mmBtu/hr, Natural gas-fired water heater
ES-760B	108th ADA DFAC, Zone A	BR67107D	0.5 mmBtu/hr, Natural gas-fired water heater
ES-761B	C-130 Flight Simulator, Zone A	PN83003	0.5 mmBtu/hr, Natural gas-fired boiler
ES-762B	O-1900U, Zone A	N/A	1.5 mmBtu/hr, No. 2 fuel oil-fired boiler
ES-763B	3-3055, Zone A	SC00007-2P	4.2 mmBtu/hr, No. 2 fuel oil-fired boiler
ES-764B	O-9071, Zone A	SC00007-2P	0.7 mmBtu/hr, No. 2 fuel oil-fired boiler
ES-765B	O-9072, Zone A	SC00007-2P	0.7 mmBtu/hr, No. 2 fuel oil-fired boiler
ES-766B	North Ops Addition, Zone A	PN66315	0.3 mmBtu/hr, No. 2 fuel oil-fired boiler
ES-767B	SOF Medical Clinic Addition, Zone A	PN65052	0.75 mmBtu/hr, No. 2 fuel oil-fired boiler
ES-768B	SOF Medical Clinic Addition, Zone A	PN65052	0.75 mmBtu/hr, No. 2 fuel oil-fired boiler
ES-00BI1	525 MI TEMF, Zone A	PN16992	0.3 mmBtu/hr, Natural gas-fired heating ventilating unit
ES-00BI2	525 MI TEMF, Zone A	PN16992	0.4 mmBtu/hr, Natural gas-fired heating ventilating unit
ES-00BI3	Y5015, Zone B	PN20815	0.8 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI4	Y5015, Zone B	PN20815	0.8 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI5	Y5015, Zone B	PN20815	0.8 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI6	Y5015, Zone B	PN20815	0.8 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI7	Y5015, Zone B	PN20815	0.8 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI8	Y5015, Zone B	PN20815	0.8 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI9	Y5015, Zone B	PN20815	1.9 mmBtu/hr, Natural gas-fired heating ventilating unit
ES-00BI10	Y5015, Zone B	PN20815	0.93 mmBtu/hr, Natural gas-fired heating ventilating unit
ES-00BI11	Y5015, Zone B	PN20815	1.25 mmBtu/hr, Natural gas-fired heating ventilating unit
ES-00BI12	Y5015, Zone B	PN20815	0.93 mmBtu/hr, Natural gas-fired heating ventilating unit
ES-00BI13	Y5015, Zone B	PN20815	1.25 mmBtu/hr, Natural gas-fired heating ventilating unit
ES-00BI14	Y5015, Zone B	PN20815	0.93 mmBtu/hr, Natural gas-fired heating ventilating unit
ES-00BI15	Y5015, Zone B	PN20815	0.35 mmBtu/hr, Natural gas-fired heating ventilating unit
ES-00BI16	108th ADA 1-7 TEMF, Zone A	PN67107	0.3 mmBtu/hr, Natural gas-fired water heater (< 120 gallons)
ES-00BI17	108th ADA 1-7 TEMF, Zone A	PN67107	0.06 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI18	108th ADA 1-7 TEMF, Zone A	PN67107	0.04 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI19	108th ADA 1-7 TEMF, Zone A	PN67107	0.25 mmBtu/hr, Natural gas-fired heating ventilating unit
ES-00BI20	108th ADA 1-7 TEMF, Zone A	PN67107	0.25 mmBtu/hr, Natural gas-fired heating ventilating unit
ES-00BI21	108th ADA 1-7 TEMF, Zone A	PN67107	0.25 mmBtu/hr, Natural gas-fired heating ventilating unit
ES-00BI22	108th ADA 1-7 TEMF, Zone A	PN67107	0.25 mmBtu/hr, Natural gas-fired heating ventilating unit
ES-00BI23	108th ADA 1-7 TEMF, Zone A	PN67107	0.25 mmBtu/hr, Natural gas-fired heating ventilating unit
ES-00BI24	108th ADA 1-7 TEMF, Zone A	PN67107	0.20 mmBtu/hr, Natural gas-fired heating ventilating unit
ES-00BI25	108th ADA 1-7 TEMF, Zone A	PN67107	0.23 mmBtu/hr, Natural gas-fired heating ventilating unit
ES-00BI26	108th ADA SSA, Zone A	PN67107	0.04 mmBtu/hr, Natural gas-fired infrared heater

ES-00BI27	108th ADA SSA, Zone A	PN67107	0.04 mmBtu/hr, Natural gas-fired infrared heater

Table 1 Changes to the Air Permit per application 2600102.12C (Continued)

ID Number	Building/Description	Project No.	Description
ES-00BI28	108th ADA SSA, Zone A	PN67107	0.04 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI29	108th ADA SSA, Zone A	PN67107	0.04 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI30	108th ADA SSA, Zone A	PN67107	0.04 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI31	108th ADA SSA, Zone A	PN67107	0.04 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI32	525 MI TEMF, Zone A	PN67107	0.04 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI33	525 MI TEMF, Zone A	PN67107	0.04 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI34	108th Brigade TEMF, Zone A	PN70751	0.05 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI35	108th Brigade TEMF, Zone A	PN70751	0.05 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI36	108th Brigade TEMF, Zone A	PN70751	0.05 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI37	108th Brigade TEMF, Zone A	PN70751	0.05 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI38	108th Brigade TEMF, Zone A	PN70751	0.05 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI39	108th Brigade TEMF, Zone A	PN70751	0.04 mmBtu/hr, Natural gas-fired infrared heater
ES-00BI40	108th Brigade TEMF, Zone A	PN70751	0.186 mmBtu/hr, Natural gas-fired heat recovery unit
ES-00BI41	108th Brigade TEMF, Zone A	PN70751	0.186 mmBtu/hr, Natural gas-fired heat recovery Unit
ES-00BI42	108th Brigade TEMF, Zone A	PN70751	0.085 mmBtu/hr, Natural gas-fired heat recovery Unit
ES-00BI43	108th Brigade TEMF, Zone A	PN70751	0.085 mmBtu/hr, Natural gas-fired heat recovery Unit
ES-00BI44	525th TEMF, Zone A	BR16992	0.285 mmBtu/hr, Natural gas-fired heating ventilating unit
ES-00BI45	525th TEMF, Zone A	BR16992	0.4 mmBtu/hr, Natural gas-fired heating ventilating unit
ES-00BI46	108th ADA DFAC, Zone A	BR67107D	0.981 mmBtu/hr, Natural gas-fired rooftop unit
ES-00BI47	108th ADA DFAC, Zone A	BR67107D	0.12 mmBtu/hr, Natural gas-fired rooftop unit
ES-00BI48	108th ADA DFAC, Zone A	BR67107D	0.05 mmBtu/hr, Natural gas-fired rooftop unit
ES-00BI49	108th ADA DFAC, Zone A	BR67107D	0.074 mmBtu/hr, Natural gas-fired rooftop unit
ES-00BI50	108th ADA DFAC, Zone A	BR67107D	0.18 mmBtu/hr, Natural gas-fired rooftop unit
ES-00BI51	108th ADA DFAC, Zone A	BR67107D	0.18 mmBtu/hr, Natural gas-fired rooftop unit
ES-00BI52	108th ADA DFAC, Zone A	BR67107D	0.172 mmBtu/hr, Natural gas-fired rooftop unit
ES-00BI53	108th ADA DFAC, Zone A	BR67107D	0.254 mmBtu/hr, Natural gas-fired rooftop unit
ES-00BI54	108th ADA DFAC, Zone A	BR67107D	0.072 mmBtu/hr, Natural gas-fired rooftop unit
ES-00BI55	108th ADA DFAC, Zone A	BR67107D	0.6 mmBtu/hr, Natural gas-fired makeup air unit
ES-00BI56	108th ADA DFAC, Zone A	BR67107D	0.6 mmBtu/hr, Natural gas-fired makeup air unit
ES-00BI57	108th ADA DFAC, Zone A	BR67107D	0.4 mmBtu/hr, Natural gas-fired makeup air unit
ES-00BI58	108th ADA DFAC, Zone A	BR67107D	0.35 mmBtu/hr, Natural gas-fired makeup air unit
ES-00BI59	108th ADA DFAC, Zone A	BR67107D	0.1 mmBtu/hr, Natural gas-fired makeup air unit
ES-00BI60	108th ADA DFAC, Zone A	BR67107D	0.3 mmBtu/hr, Natural gas-fired makeup air unit
ES-00BI61	108th ADA DFAC, Zone A	BR67107D	0.3 mmBtu/hr, Natural gas-fired makeup air unit
ES-00BI62	108th ADA DFAC, Zone A	BR67107D	0.3 mmBtu/hr, Natural gas-fired makeup air unit
ES-00BI63	108th ADA DFAC, Zone A	BR67107D	0.15 mmBtu/hr, Natural gas-fired makeup air unit
ES-27W	A-3319, Zone A	N/A	Welding operation
ES-28W	M-8311, Zone B	N/A	Welding operation
Equipment Removals			
ES-135GI	707	N/A	Diesel fuel-fired emergency generator (200 kW)
ES-143GI	813	N/A	Diesel fuel-fired emergency generator (500 kW)
ES-11PSG	O-1900M	N/A	Diesel fuel-fired peak shaver/emergency generator (850 kW)

ES-12PSG	O-1900M	N/A	Diesel fuel-fired peak shaver/emergency generator (850 kW)
ES-13PSG	O-1900M	N/A	Diesel fuel-fired peak shaver/emergency generator (850 kW)

IV. Changes to existing permit per application 2600102.12C:

Old Page No.	New Page No.	Condition No.	Changes
Cover Letter			
Page 1	Page 1	Heading and body of letter	Changed Governor's name, changed Secretary's name, revised issue date, revised permit number, changed "complete application" received date,
Page 2	Page 2	Heading and body of letter	Revised issued date at the top of letter, and changed the effective date of permit, added NOx, SO_2 and PM10 hourly contributions for the addition of the new sources in this application
Page 3	Page 3	"Changes to Permit" Table	Updated the table to reflect the changes per this modification
Insignificant Activities List			
Page 1 of 4	N/A	Table	Removed IES-01WO from permit
N/A	Page 4 of 4		Added all insignificant roof top units, makeup air units, and heating ventilation units that had heat inputs less than 0.2 mmBtu/per hour
Changes to Body of Permit			
Page 1	Page 1	Cover Page	Changed issue date, changed "replaces permit revision number, changed effective date, changed application number, changed complete application date,
Page 2	Page 2	Table of Contents	Removed Section 2.3 Schedule of Compliance from page
All pages	All pages	Page heading	Changed permit revision number to T37
N/A	Page 3 - 18	Table of Permitted Sources	Added page numbers to table to locate sources
Page 4	Page 4		Changed boiler rating from 1.2 to 1.5 mmBtu per hour heat input (for ES-603B and ES-604B)
Page 5	N/A		Removed ES-135GI, ES-621B, and ES-622B from table of permitted sources
Page 6	Page 6		Removed ** from ID numbers for previous peak shaving units, removed peak shavers ES-11PSG, 12PSG, and 13PSG from permit, removed the option to operate units as peak shavers for (ES-01PSG through 08PSG, 10PSG and 16PSG
Page 12	Page 12		Changed engine (ES-152GI) rating from 350 kW to 500 kW, removed ES-135GI and ES-143GI from table of permitted sources
Page 43	N/A	Specific Limitations and Conditions	Removed ES-11PSG, ES-12PSG, and ES-13PSG from permit
Page 44	Page 44		Removed "hp" from the description for ES-38G, 41G, and 83G
Page 45	N/A		Removed ES-135GI from table
Page 46	Page 46		Changed engine (ES-152GI) rating from 350 kW to 500 kW, removed ES-143GI from the table
Page 52	Page 52		Changed the paint booth count to four instead of five in Condition 2.1 O, page 52
Page 59	Page 59		Changed rating of tank purger to 5.0 mmBtu per hour heat input, changed combustion fuel language in Condition 2.1 T. 2. C. to fire propane only.
Page 62	N/A		Removed PSD Avoidance condition for peak shaving units
Page 66	N/A		Remove the 112r condition, Fort Bragg is no longer subject to this requirement
Page 71	N/A		Removed ES-135GI from table
Page 73	N/A		Removed table and requirements for existing non-emergency generators less than 500 bhp
Page 74-76	N/A		Removed ES-11PSG, ES-12PSG, and ES-13PSG from permit, removed table and requirements for existing non-emergency generators greater than 500 bhp
Page 77	N/A		Removed ES-143GI from table, removed ES-11PSG, ES-12PSG, and ES-13PSG from permit
Page 84	Page 84	Multiple Emissions Section 2.2	Changed engine (ES-152GI) rating from 350 kW to 500 kW
Page 88	N/A	Section 2.3	Removed Section 2.3 "Schedule of Compliance"

V. Statement of Compliance:
The DAQ has reviewed the compliance status of this facility. Mr. Robert Hayden of the FRO, performed a facility inspection on January 24, 2013 and the facility appeared to be in compliance with all applicable requirements.

VI. Source-by Source Evaluation for Modification Revision T37:

A. Emergency generators and peak shaving generator (application 2600102.12C):
- Emergency generators ES-181GI through ES-183GI (application 2600102.12C)
- Peak Shaver/Emergency generator ES-17PSG (application 2600102.12C)
- Fire Pump ES-17FPO19F2 (application 2600102.12C)

1. Description:
All of the emergency generators, the fire pump, and the peak shaving unit in this application is fired by Diesel fuel only. The maximum operation of each emergency generator shall not exceed 500 hours per the 1995 EPA guidance from John S. Seitz, Director of the Office of Air Quality Planning and Standards. Emissions from the generators, fire pump, and the peak shaving unit are uncontrolled.

2. Applicable Regulatory Requirements: This facility has already triggered a facility wide toxics evaluation and has performed modeling which was submitted in application 2600102.12A. Under the current regulatory requirements, new combustion sources will be evaluated for toxic air pollutants in accordance with G.S. 143-215.107.

The fire pump engine and the emergency generator engines (except ES-17PSG) in this application are subject to NSPS (Subpart IIII), and MACT (Subpart ZZZZ). ES-17PSG was manufactured in 2003 which predates (commenced construction date = July 2005) NSPS Subpart IIII for compression ignition engines. ES-17PSG is considered a "new" stationary RICE because it has a site rating of more than 500 hp, is located at a major source of HAPs and commenced construction after December 19, 20102. Subpart ZZZZ was revised, and re-published in the Federal Register on January 18, 2008 with an effective date of March 18, 2008. This revision included engines with capacities greater than 500 brake horsepower and engines with capacities less than 500 brake horsepower located at major sources of HAP emissions.

<u>40 CFR Part 60, New Source Performance Standard, Subpart IIII:</u>

- Per 40 CFR §60.4200(a) NSPS, Subpart IIII does apply to ES-181GI through ES0183GI and fire pump ES-17FPO19F2. This regulation does not apply to the peak shaver/emergency generator ES-17PSG because of the manufacture date.

<u>40 CFR Part 63, Maximum Achievable Control Technology, Subpart ZZZZ:</u>

- Per 40 CFR §63.6590(a)(2)(ii), a stationary RICE with a site rating of equal to or less than 500 brake hp located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12, 2006.

- Per 40 CFR §63.6590(c)(6) "Stationary RICE Subject Regulations under 40 CFR Part 60" a new compression ignition emergency generator (includes fire pump) with a site rating <u>less than 500</u> brake horsepower located at a major source of HAP emissions <u>can meet</u> the requirements of Subpart ZZZZ by meeting the requirements of NSPS Subpart IIII. No further requirements apply for such engines under this part.

- When generator (ES-17PSG) is operating in peak shaving mode: Per 40 CFR §63.6600(b), a new stationary compression ignition (CI) RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions must comply with the emission limitations in Table 2a to this Subpart and the operating limitations in Table 2b that apply.

The following provides a summary of limits and/or standards for the emission sources described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Visible emissions	20 percent opacity	15A NCAC 2D .0521
Sulfur dioxide	Burn fuel that contains less than 15 parts per million sulfur content	15A NCAC 2D .0524 40 CFR Part 60 Subpart IIII
Hazardous Air Pollutants	Meet the requirements of NSPS Subpart IIII for units less than 500 hp • ES-181GI • ES-182GI • ES-183GI • ES-17FPO19F2 Peak shaving generator (ES-17PSG) must meet the requirements of Table 2a and 2b in Subpart ZZZZ	15A NCAC 2D .1111 40 CFR Part 63, Subpart ZZZZ
NMHC + NOx, HC, NOx, CO, PM	For emergency engines: Purchase engine certified to meet the applicable engine design emission limits	15A NCAC 2D .0524 40 CFR Part 60 Subpart IIII
Toxic air pollutants	Evaluation required	15A NCAC 2Q .0702(18) G.S. 143-215.107

a. 15A NCAC 2D .0521"Control Of Visible Emissions"

Regulation Analysis:

i. Generators will be installed after July 1, 1971, and each is therefore subject to the State regulation 15A NCAC 2D .0521(d). Per this regulation visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute periods averaging more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period for each boiler.

Compliance is expected with this regulation because all of the generators will be firing diesel fuel.

Monitoring/Recordkeeping/Reporting [15A NCAC 2Q .0508(f)]

ii. No monitoring, recordkeeping, or reporting is required for visible emissions from the firing of diesel fuel in any engine because it should always be in compliance with the opacity standard during normal operation.

b. 15A NCAC 2D .1111, 40 CFR Part 63, Subpart ZZZZ: National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines

i. General Provisions [40 CFR §63.6665]:
The Permittee shall comply with the requirements of 40 CFR part 63 Subpart A "General provisions," according to the applicability of Subpart A to such sources, as identified in Table No. 8 in Subpart ZZZZ, "Applicability of General Provisions to Subpart ZZZZ".

ii. Compliance/Notification Procedures [40 CFR §63.6645]
Per 40 CFR §63.6590(c) "Stationary RICE Subject Regulations Under 40 CFR Part 60", new emergency compression ignition generators less than 500 brake horsepower site rating must only meet the requirements of NSPS, Subpart IIII.

Table 2a to Subpart ZZZZ of Part 63 - Emission Limitations for New Compression Ignition Stationary RICE > 500 HP Located at a Major Source of HAP Emissions. As stated in §§ 63.6600 and 63.6640, you must comply with the following emission limitations for new compression ignition stationary RICE at 100 percent load plus or minus 10 percent:

For each . . .	You must meet the following emission limitation, except during periods of startup . . .	During periods of startup you must . . .
CI stationary RICE	a. Reduce CO emissions by 70 percent or more; or	
	b. Limit concentration of formaldehyde in the stationary RICE exhaust to 580 ppbvd or less at 15 percent O_2	

As stated in §§ 63.6600, 63.6601, 63.6603, 63.6630, and 63.6640, you must comply with the following operating limitations for new compression ignition stationary RICE located at a major source of HAP emissions:

For each . . .	You must meet the following operating limitation . . .
CI stationary RICE complying with the requirement to limit the concentration of formaldehyde in the stationary RICE exhaust and using an oxidation catalyst; or CI stationary RICE complying with the requirement to limit the concentration of CO in the stationary RICE exhaust and using an oxidation catalyst	a. maintain your catalyst so that the pressure drop across the catalyst does not change by more than 2 inches of water at 100 percent load plus or minus 10 percent from the pressure drop across the catalyst that was measured during the initial performance test; and b. maintain the temperature of your stationary RICE exhaust so that the catalyst inlet temperature is greater than or equal to 450 °F and less than or equal to 1350 °F.[1]
CI stationary RICE complying with the requirement to reduce CO emissions and not using an oxidation catalyst; or CI stationary RICE complying with the requirement to limit the concentration of formaldehyde in the stationary RICE exhaust and not using an oxidation catalyst; CI stationary RICE complying with the requirement to limit the concentration of CO in the stationary RICE exhaust and not using an oxidation catalyst	Comply with any operating limitations approved by the Administrator.

[1] Sources can petition the Administrator pursuant to the requirements of 40 CFR 63.8(g) for a different temperature range.

The owner or operator of an affected source that has an initial startup before the effective date of a relevant standard under this part shall notify the Administrator in writing that the source is subject to the relevant standard. The notification, which shall be submitted not later than 120 calendar days after startup of the emergency generator and shall provide the following:

(A) The name and address of the owner or operator;
(B) The address (i.e., physical location) of the affected source;
(C) An identification of the relevant standard, or other requirement, that is the basis of the notification and the source's compliance date;
(D) A brief description of the nature, size, design, and method of operation of the source and an identification of the types of emission points within the affected source subject to the relevant standard and types of hazardous air pollutants emitted;
(E) A statement of whether the affected source is a major source or an area source.
(F) A statement that each generator has no additional requirements and explain the basis for the exclusion (for example, that the units operate exclusively as emergency stationary RICE).

iii. Recordkeeping Requirement For Applicability Determination [40 CFR §63.10(b)(3)]
The applicability determination for exclusion of the emergency generators from the requirements of 40 CFR Part 63, Subpart ZZZZ and Subpart A of this part, shall be maintained on site for a period of 5 years after the determination, or until the source changes its operations to become an affected source, whichever comes first. The analyses, or other information, that demonstrates the exemption from the requirements of Subpart ZZZZ and part A of this subpart, shall be signed by the person making the determination.

iv. Monitoring/Reporting [15A NCAC 2Q .0508(f)]

- Owner/operators who purchase an emergency generator that is less that 30 liters per cylinder must purchase units that are certified by the manufacturer to meet the applicable engine design emission limits. {§60.4211 (c)}.
- Owners/operators must operate and maintain engines and control devices in accordance with the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the life of the engine. {§60.4206 and §60.4211 (a)}.
- No testing is required for units less than 30 liter per cylinder displacement that have been certified by the manufacturer to meet design limits.
- Install a nonresettable hour meter {§60.4209(a)}.

c. 15A NCAC 2D .0524: NEW SOURCE PERFORMANCE STANDARDS, SUBPART IIII

Applicability [15A NCAC 2Q .0508(f), 40 CFR 60.4200(a)(2(i))]

i. For each engine, the Permittee shall comply with all applicable provisions, including the requirements for emission standards, notification, testing, reporting, record keeping, and monitoring, contained in Environmental Management Commission Standard 15A NCAC 2D .0524 "New Source Performance Standards (NSPS)" as promulgated in 40 CFR Part 60 Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines," including Subpart A "General Provisions."

General Provisions [15A NCAC 2Q .0508(f)]

ii. Pursuant to 40 CFR 60 .4218, The Permittee shall comply with the General Provisions of 40 CFR 60 Subpart A as presented in Table 8 of 40 CFR 60 Subpart IIII.

Emission Standards [15A NCAC 2Q .0508(f)]

iii. The Permittee shall comply with the emission standards for new non-road CI engines in 40 CFR 60.4202, for all pollutants, for the same model year and maximum engine power for this source. [40CFR 60.4205(b)]

Fuel Requirements [15A NCAC 2Q .0508(f)]

iv. The Permittee shall use diesel fuel in the engine with:
i. a maximum sulfur content of 15 ppm; and
ii. a minimum cetane index of 40 or a maximum aromatic content of 35 volume percent.
[40CFR 60.4207(b) and 40CFR 80.510(b)]

Testing [15A NCAC 2Q .0508(f)]

v. If emission testing is required, the testing shall be performed in accordance with General Condition JJ. If the results of this test are above the limits given in above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524.

Monitoring [15A NCAC 2Q .0508(f)]

vi. The engine has the following monitoring requirements:
(A) The engine shall be equipped with a non-resettable hour meter prior to startup. [40CFR 60.4209(a)]
(B) The engine, if equipped with a diesel particulate filter, must be installed with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached. [40CFR 60.4209(b)]

Compliance Requirements [15A NCAC 2Q .0508(b)]

vii. The Permittee shall:
(A) Operate and maintain the engines and control devices according to the manufacturer's emission related-written instructions over the entire life of the engine;
(B) Change only those emission-related settings that are permitted by the manufacturer; and
(C) Meet the requirements of 40 CFR 89, 94 and/or 1068 as applicable.
[40CFR 60.4206 and 60.4211(a)]

viii. The Permittee shall comply with the emission standards for emergency generators by purchasing an engine certified to the emission standards in condition c. The engine shall be installed and configured according to the manufacturer's emission-related specifications. [40CFR 60.4211(c)]

ix. Emergency stationary ICE may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. There is no time limit on the use of emergency stationary ICE in emergency situations. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. Emergency stationary ICE may operate up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply non-emergency power as part of a financial arrangement with another entity. For owners and operators of emergency engines, any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as permitted in this section, is prohibited.
[40CFR 60.4211(f)]

The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524, if the requirements in conditions f. through i. are not met.

Recordkeeping [15A NCAC 2Q .0508(f)]

x. To assure compliance, the Permittee shall perform inspections and maintenance on the engine as recommended by the manufacturer per 40 CFR 60.4206 and 40 CFR 60.4211(a). The results of inspection and maintenance shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request. The logbook shall record the following:
(A) the date and time of each recorded action;
(B) the results of each inspection;
(C) the results of any maintenance performed on the engine;
(D) any variance from manufacturer's recommendations, if any, and corrections made;
(E) the hours of operation of the engine in emergency and non-emergency service. [40 CFR60.4214(b)]
(F) If a PM filter is used, records of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit of the engine is approached [40 CFR60.4214(c)]; and
(G) Documentation from the manufacturer that the engine is certified to meet the emission standards in condition c.

The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524 if these records are not maintained.

Reporting [15A NCAC 2Q .0508(f)]

xi. The Permittee shall submit a summary report of monitoring and recordkeeping activities postmarked on or before January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period between January and June. All instances of noncompliance with the requirements of this permit shall be clearly identified.

d. The following PSD evaluation is for the individual project that are installing Diesel fuel fired emergency generators, the fire pump, and/or the peak shaving generator. Fort Bragg is a PSD major source for criteria pollutants. Modifications are evaluated against the PSD major source significance levels according to individual projects.

The Diesel fuel-fired engines will emit CO, NOx, PM, PM10, PM2.5, SO_2, VOCs, and GHGs. NOx will be the worse case pollutant that will be emitted from the generators. All of the proposed engines will be subject to NSPS Subpart IIII and are therefore required to meet the limitations in this Subpart for CO, NOx, PM10, and VOCs.

Pollutant	Major Source Significance level
GHGs	75,000 tpy
PM	25 tpy
PM10	15 tpy
PM2.5	10 tpy
SO_2	40 tpy
VOCs	40 tpy
CO	100 tpy
NOx	40 tpy

The individual projects (SC00008-2P and PN72136) for the three emergency generators (ES-182GI, 183GI, and 184GI) do not have emissions large enough to exceed the PSD significance threshold levels operating at a maximum 500 hours per year.

The individual project (SF00029-0P) for the fire pump (ES-17PO19F2) does not have emissions large enough to exceed the PSD significance threshold levels operating at a maximum 500 hours per year.

The following example calculation is for the peak shaving generator (ES-17PSG, project Number 433-12226) which has the potential to operate for 8760 hours per year.

- Using 8760 hours per year maximum operation for the peak shaving unit for calculations
- Maximum kW rating = 2700 kW
- NOx = 6.4 g/kW-hr (NSPS Subpart IIII, 40 CFR 89.112 emission limit prior to year 2014)
- CO = 3.5 g/kW-hr (NSPS Subpart IIII, 40 CFR 89.112 emission limit prior to year 2014)
- PM/PM10 = 0.2 g/kW-hr (NSPS Subpart IIII, 40 CFR 89.112 emission limit prior to year 2014)
- PM2.5 = 7.0E-04 lbs/hp-hour (DAQ spread sheet)
- SO_2 = 4.05E-03 lbs/hp-hour (DAQ spread sheet)
- VOCs = 6.42E-04 lbs/hp-hour (DAQ spread sheet)

From 40 CFR Part 98, "Mandatory Green House Gas Reporting", Tables C-1 and C-2)
- Emission factor for No. 2 fuel oil = 73.96 kg CO_2/mmBtu
- Emission factor for No. 2 fuel oil = 3.0E-03 kg CH_4/mmBtu
- Emission factor for No. 2 fuel oil = 6.0E-04 kg N_2O/mmBtu

Globing Warming Potentials from 40 CFR Part 98, A-1 (CO_2 equivalence)
- CO_2 = 1
- CH_4 = 21
- N_2O = 310

GHGs (CO_2, CH_4, N_2O):
Fort Bragg is a major PSD source for GHG emissions (> 100,000 tpy). The GHG emission factors were taken from 40 CFR Part 98 "Mandatory Greenhouse Gas Reporting", Subpart C, Table C-2 for Petroleum fuel types) are shown above. The total GHG emission rate from the peak shaving generator is less than 75,000 tons per year (at 18,104 tpy) threshold. Therefore, no PSD avoidance condition for GHGs will be written for the peak shaver or any of the engine/generator projects with smaller combined kilowatt ratings. *See example calculations below.*

Calculations for the peak shaving unit @ 2700 kW rated capacity:
This example calculation is for the GHG emissions from the peak shaving project (433-12226) to install ES-17PSG @ 8760 hours per year. In accordance with EPA's AP-42 Chapter 3.3 (Table 3.3-1; Reference a), an average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr was used to convert from lb/mmBtu to lb/hp-hr when necessary.

$$\frac{2700\ kW}{engine} \times \frac{1.341\ hp}{1\ kW} \times = \frac{3621\ hp}{engine}$$

$$\frac{73.96\ kg\ CO_2}{1\times10^6\ Btu} \times \frac{1000\ g}{kg} \times \frac{1\ lb}{453.59\ g} \times \frac{7000\ Btu}{hp-hr} = \frac{1.1414\ lbs\ CO_2}{hp-hr}$$

$$\left[\frac{1.1414\ lbs\,CO_2}{\text{hp-hr}} \times 3621\ hp\right] \times \frac{1\,\text{ton}}{2000\ \text{lbs}} \times \frac{8760\ \text{hrs}}{\text{year}} = \frac{18{,}103\ \text{tons}\,CO_2}{\text{year}}$$

$$\frac{3.0E-03\ kg\ CH_4}{1\times10^6\ Btu} \times \frac{1000\ g}{kg} \times \frac{1\ lb}{453.59\ g} \times \frac{7000\ Btu}{hp-hr} \times \frac{3621\ hp}{1} \times \frac{1\ ton}{2000\ lbs} \times \frac{8760\ hrs}{year} = \frac{0.73\ tons\ CH_4}{year}$$

$$\frac{6.0E-04\ kg\ N_2O}{1\times10^6\ Btu} \times \frac{1000\ g}{kg} \times \frac{1\ lb}{453.59\ g} \times \frac{7000\ Btu}{hp-hr} \times \frac{3621\ hp}{1} \times \frac{1\ ton}{2000\ lbs} \times \frac{8760\ hrs}{year} = \frac{0.15\ tons\ N_2O}{year}$$

Total CO_2e burning No. 2 fuel oil (Diesel fuel) = 18,103 + 0.73 + 0.15 = 18,104 tons CO_2e per year total. Therefore, no PSD avoidance condition for GHGs is required for the peak shaving unit or any of the other projects installing engines.

NOx for peak shaving unit:
Peak shaver (ES-17PSG) with separate project number (433-12226) has the potential to operate at 8760 hours per year. NOx will also be the worse-case pollutant.

$$\frac{6.4\ g\ NOx}{kW-hr} \times \frac{1\ lbs\ NOx}{453.59\ g} \times \frac{2700\ kW}{1} \times \frac{1\ \text{ton NOx}}{2000\ \text{lbs NOx}} \times \frac{8760\ \text{hrs}}{\text{year}} = \frac{167\ \text{tons NOx}}{\text{year}}$$

The applicant has requested an hourly operation limit in order to remain below the NOx 40 tpy significance level. However, the DAQ will suggest an equation based on the allowable emissions limits from NSPS Subpart which will correspond to the purchase year and model of the engine selected. A NOx PSD avoidance condition will be placed into the permit for peak shaver ES-17PSG.

15A NCAC 2D .0530 [40 CFR 51.166 (Prevention of Significant Deterioration)] for peak shaving unit:
For "Prevention of Significant Deterioration" for nitrogen oxide emissions from peak shaving generator (ES-

17PSG) shall according to the equation listed below. Total nitrogen dioxide emissions from this generator shall be less than 40.0 tons per consecutive 12 month period.

The monthly calculation shall be performed using the following equation:

$$A = 2700\ kW \times (B)\ \frac{g\ NO_x}{kW-hr} \times \frac{lb\ NOx}{453.59\ g} \times (C)\ \frac{hrs}{month} \times \frac{1\ ton\ NOx}{2000\ lbs\ NO_x}$$

Where A = Nitrogen oxide emissions (tons/month)
B = Allowable NOx emission rate per NSPS Subpart IIII (rate is dependent on the purchase year and model of the engine since this engine has not been purchased)
C = Number of hours of operation in peak shaver mode for the month

PM/PM10 for peak shaving unit:
Peak shaver (ES-17PSG, 2700 kW) with separate project number (433-12226) has the potential to operate at 8760 hours per year. PM emissions (5.21 tpy at 8760 hrs/yr) are less than the 25 tpy significance level and PM10 emissions (5.21 tpy at 8760 hrs/yr) are less than the 15 tpy significance level.

$$\frac{0.20\ g\ PM/PM10}{kW-hr}\times\frac{1\ lbs\ PM/PM10}{453.59\ g}\times\frac{2700\ kW}{1}\times\frac{1\ \text{ton}\ PM/PM10}{2000\ \text{lbs}\ PM/PM10}\times\frac{8760\ \text{hrs}}{\text{year}}=\frac{5.21\ \text{tons}\ PM/PM10}{\text{year}}$$

PM2.5 for peak shaving unit:
Peak shaver (ES-17PSG, 3621 hp) with separate project number (433-12226) has the potential to operate at 8760 hours per year. PM2.5 emissions (11.1 tpy at 8760 hrs/yr) are more than the 10 tpy significance level, however the peak shaving generator will have a permit limit to avoid PSD for NOx. This limit will also bring the annual PM2.5 emission rate well below 10 tpy.

$$\frac{7.0E-04\ lbs\ PM2.5}{hp-hr}\times 3621\ hp\times\frac{1\ \text{ton}\ PM2.5}{2000\ \text{lbs}\ PM2.5}\times\frac{8760\ \text{hrs}}{\text{year}}=\frac{11.1\ \text{tons}\ PM2.5}{\text{year}}$$

SO_2 for peak shaving unit:
NSPS Subpart IIII does not have an emission limit for SO, but it does require that all Diesel fuel fired in the engines contain less than 0.15% by weight sulfur. The SO_2 emission factor used is from AP-42, table 3.4-1 (greater than 600 hp) was corrected to 15% sulfur by weight. Therefore, no PSD avoidance condition for SO_2 will be written for any of this project or for any of the other projects with significantly lower maximum kW ratings. See example calculation below.

$$\left[\frac{8.09\text{E-}03\ lbs\ SO_2\times 0.15}{\text{hp-hour}}\times 3621\ hp\times\right]\times\frac{1\ \text{ton}}{2000\ \text{lbs}}\times\frac{8760\ \text{hrs}}{\text{year}}=\frac{19.24\ \text{tons}\ SO_2}{\text{year}}$$

Peak shaver (ES-17PSG, 3621 hp) with separate project number (433-12226) has the potential to operate at 8760 hours per year. SO_2 emissions (19.24 tpy at 8760 hrs/yr) are less than the 40 tpy significance level, therefore no PSD Avoidance condition is required.

CO for peak shaving unit:
Peak shaver (ES-17PSG, 3621 hp) with separate project number (433-12226) has the potential to operate at 8760 hours per year. CO emissions (91.25 tpy at 8760 hrs/yr) are less than the 100 tpy significance level therefore no PSD Avoidance condition is required.

$$\frac{3.5\ g\ CO}{kW-hr}\times\frac{1\ lbs\ CO}{453.59\ g}\times\frac{2700\ kW}{1}\times\frac{1\ \text{ton}\ CO}{2000\ CO}\times\frac{8760\ \text{hrs}}{\text{year}}=\frac{91.25\ \text{tons}\ CO}{\text{year}}$$

VOCs for peak shaving unit:
Peak shaver (ES-17PSG, 3621 hp) with separate project number (433-12226) has the potential to operate at 8760 hours per year. NSPS Subpart IIII does not have a separate emission limit for VOCs for this model year peak shaver. The VOC emission factor used is from DAQ spread sheet (greater than 600 hp).

$$\frac{6.42E-04\ lbs\ VOC}{hp-hr}\times\frac{3621\ hp}{1}\times\frac{1\ \text{ton}\ VOC}{2000\ \text{lbs}\ VOC}\times\frac{8760\ \text{hrs}}{\text{year}}=\frac{10.2\ \text{tons}\ VOC}{\text{year}}$$

VOC emissions (10.2 tpy at 8760 hrs/yr) are less than the 40 tpy significance level, therefore a PSD avoidance condition in not required.

B. The boilers, indirect-fired hot water heaters, and hot water boilers listed in Sections III., Table 1 of this review (from application 2600102.12C) are evaluated below. The heat input from all of these units (ID Nos. ES-740B through ES-768B and ES-00BI16) will be reviewed in accordance with 15A NCAC 2D .0503.

7. Description: All of the boilers, hot water heaters, hot water boilers, and infrared heaters at Fort Bragg are used for domestic purposes only and not to heat process water. Historically the Division of Air Quality has permitted comfort heat boilers at military bases and universities because of the size and the large number of boilers. The units at military bases are usually funded separately under a variety of projects and are therefore evaluated by the separately funded projects. The boilers, and water heaters are subject to the Boiler MACT and will be listed in the body of the permit.

8. Applicable Regulatory Requirements: These small boilers are placed into the body of the permit because they are subject to the boiler MACT. These are new boilers but NSPS Subpart Dc does not apply because each of the units is less than 10 million Btu per hour heat input. These boilers will be evaluated for toxic air pollutants in accordance with G.S. 143-215.107(a).

   15A NCAC 2D .1111 "Boiler MACT, Subpart DDDDD" will apply to the boilers in the projects in this modification because they will commence construction after June 4, 2010. Boilers and process heaters in the units designed to burn gas 1 fuels (natural gas) subcategory with a heat input capacity of less than or equal to 5 million Btu per hour must complete a tune-up every 5 years as specified in § 63.7540. Boilers and process heaters in the units designed to burn gas 1 fuels subcategory with a heat input capacity greater than 5 million Btu per hour and less than 10 million Btu per hour must complete a tune-up every 2 years as specified in § 63.7540. Boilers and process heaters in the units designed to burn gas 1 fuels subcategory are not subject to the emission limits in Tables 1 and 2 or 11 through 13 to this subpart, or the operating limits in Table 4 to this subpart [40 CFR 63.7500(e)]. This regulation does not apply to hot water heaters that are heated by gaseous or liquid fuel with a capacity of no more than 120 US gallon capacity.

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Particulate matter	0.16 lbs per million Btu heat input	15A NCAC 2D .0503
Sulfur dioxide	2.3 pounds per million Btu heat input	15A NCAC 2D .0516
Visible emissions	20 percent opacity	15A NCAC 2D .0521
Toxic air pollutants	Evaluation required by the DAQ	G.S. 143-215.107
HAPS	Work practice standards	15A NCAC 2D .1111 Subpart DDDDD

Because these boilers are not subject to NSPS Subpart Dc (heat inputs less than 10 million Btu per hour), particulate emission rates will have allowable emission rates in accordance with 15A NCAC 2D .0503 (e). Per this regulation, the maximum heat input shall be the total heat content of all fuels that are burned in a fuel burning indirect heat exchanger, of which the combustion products are emitted through a stack or stacks. The sum of maximum heat input of all fuel burning indirect heat exchangers at a plant site that are in operation, under construction, or permitted pursuant to 15A NCAC 2Q, shall be considered as the total heat input for the purpose of determining the allowable emission limit for particulate matter for each fuel burning indirect heat exchanger.

Fuel burning indirect heat exchangers constructed or permitted after February 1, 1983, shall not change the allowable emission limit of any fuel burning indirect heat exchanger whose allowable emission limit has previously been set.

The removal of a fuel burning indirect heat exchanger shall not change the allowable emission limit of any fuel burning indirect heat exchanger whose allowable emission limit has previously been established. However, for any fuel burning indirect heat exchanger constructed after, or in conjunction with, the removal of another fuel burning indirect heat exchanger at the plant site, the maximum heat input of the removed fuel burning indirect heat exchanger shall no longer be considered in the determination of the allowable emission limit of any fuel burning indirect heat exchanger constructed after or in conjunction with the removal.

a. 15A NCAC 2D .0503: PARTICULATES FROM FUEL BURNING INDIRECT HEAT EXCHANGERS
   vi. Emissions of particulate matter from the combustion of natural gas that are discharged from these sources into the atmosphere shall not exceed 0.18 pounds per million Btu heat input. [15A NCAC 2D .0503(a)]

Table 2 Boilers currently permitted at Fort Bragg and the new boilers per application (2600102.12C):

ID No.	Heat input (mmBtu/hr)	Type of fuel	Description	Project Number
Boilers, and water heaters	996.11 mm/Btu hr total at the facility in as listed in revision T36	Natural gas, No. 2 fuel oil, recycled	Various combustion devices	----------

currently at facility		No. 2 fuel oil, Diesel fuel		
ES-740B	0.3 mmBtu/hr	Natural gas	Boiler	PN16992
ES-741B	0.4 mmBtu/hr	Natural gas	Boiler	
ES-742B	0.50 mmBtu/hr	Natural gas	Water heater	PN74987
ES-743B	0.50 mmBtu/hr	Natural gas	Water heater	
ES-744B	0.30 mmBtu/hr	Natural gas	Boiler	PN80112
ES-745B	0.30 mmBtu/hr	Natural gas	Boiler	
ES-746B	1.5 mmBtu/hr	Natural gas	Boiler	PN20347
ES-747B	1.5 mmBtu/hr	Natural gas	Boiler	
ES-748B	1.5 mmBtu/hr	Natural gas	Boiler	
ES-752B	0.25 mmBtu/hr	Natural gas	Water heater, less than 120 gallons	PN44968
ES-753B	1.5 mmBtu/hr	Natural gas	Boiler	
ES-754B	0.3 mmBtu/hr	Natural gas	Water heater	PN67107
ES-755B	0.25 mmBtu/hr	Natural gas	Water heater	PN70751
ES-756B	0.25 mmBtu/hr	Natural gas	Water heater	
ES-759B	0.5 mmBtu/hr	Natural gas	Water heater	BR67107D
ES-760B	0.5 mmBtu/hr	Natural gas	Water heater	
ES-761B	0.50 mmBtu/hr	Natural gas	Boiler	PN83003
ES-762B	1.5 mmBtu/hr	Fuel oil	Boiler	N/A
ES-763B	4.20 mmBtu/hr	No. 2 fuel oil	Boiler	SC00007-2P
ES-764B	0.70 mmBtu/hr	No. 2 fuel oil	Boiler	
ES-765B	0.70 mmBtu	No. 2 fuel oil	Boiler	
ES-766B	0.30 mmBtu/hr	No. 2 fuel oil	Boiler	PN66315
ES-767B	0.75 mmBtu/hr	No. 2 fuel oil	Boiler	PN65052
ES-768B	0.75 mmBtu/hr	No. 2 fuel oil	Boiler	
Total for this modification = 19.75 mmBtu/hr				
Total heat input at the facility = 996.11 + 19.75 = 1015.86 mmBtu/hr heat input				

$E = 1.090 \times Q^{-0.2594}$ Where: E = allowable PM emission rate in lbs/mmBtu heat input
Q = maximum heat input rate in million Btu per hour

$E = 1.090 \times Q^{-0.2594}$
$E = 1.090 \times (1015.86)^{-0.2594}$
$E_{allow} = 0.18$ pounds PM per million Btu heat input

The particulate matter emission rate from the burning of natural gas and/or No. 2 fuel oil in any boiler was estimated using AP-42 factors, Supplement E, revised 9/98, a heating value of 1020 Btu per cubic foot of natural gas.

$$\frac{7.6\ lbs PM}{10^6\ cubic\ feet} \times \frac{1\ cubic\ foot\ natural gas}{1020\ Btu} \times \frac{10^6\ Btu}{million Btu} = \frac{0.0074\ lbs PM}{million Btu}$$

$$\frac{2.38\ lbs PM}{10^3\ gallons No.2\ fuel\ oil} \times \frac{1\ gallon No.2\ fuel\ oil}{141{,}000\ Btu} \times \frac{10^6\ Btu}{million Btu} = \frac{0.017\ lbs PM}{million Btu}$$

Compliance is indicated when any of the boilers burn natural gas or No. 2 fuel oil, since the actual emission rate is less than the allowable emission rate (0.16 lbs PM per million Btu heat input).

Testing [15A NCAC 2D .0501(c)(3)]

ii. If emission testing is required, the testing shall be performed in accordance General Condition JJ located in Section 3 of the Air Permit. If the results of this test are above the limit given above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0503.

Monitoring [15A NCAC 2Q .0508(f)]

iii. No monitoring, recordkeeping, or reporting is required for particulate emissions from the firing of natural gas and/or No. 2 fuel oil in any boiler or heater.

b. 15A NCAC 2D .0516: SULFUR DIOXIDE EMISSIONS FROM COMBUSTION SOURCES

i. Emissions of sulfur dioxide from these sources shall not exceed 2.3 pounds per million Btu heat input. Sulfur dioxide formed by the combustion of sulfur in fuels, wastes, ores, and other substances shall be included when determining compliance with this standard. [15A NCAC 02D .0516]

Testing [15A NCAC 2D .2601]

ii. If emission testing is required, the testing shall be performed in accordance with 15A NCAC 2D .2601 and General Condition JJ found in Section 3 of the Permit. If the results of this test are above the limit given above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0516.

AP-42 emission factor for natural gas = 0.6 lbs SO_2/mmcf
AP-42 emission factor for no. 2 fuel oil with (0.5% by weight S) = 71 lbs SO_2/1000 gallons

$$\frac{0.6\ lbs\ SO_2}{10^6\ cubic\ \ feet\ \ natural\ \ gas} \times \frac{1\ cubic\ \ foot\ \ natural\ \ gas}{1020\ Btu} \times \frac{10^6\ Btu}{million\ \ Btu} = 0.00058\ \frac{lbs\ PM}{million\ \ Btu}$$

$$\frac{71.0\ lbs\ SO_2}{10^3\ gallons\ \ No.\ 2\ \ fuel\ \ oil} \times \frac{1\ gallon\ \ No.\ 2\ \ fuel\ \ oil}{141{,}000\ Btu} \times \frac{10^6\ Btu}{million\ \ Btu} = \frac{0.5\ lbs\ SO_2}{million\ \ Btu}$$

Compliance is indicated when any boiler or heater burns natural gas or No. 2 fuel oil since the actual emission rate is less than the allowable emission rate (2.3 lbs SO_2 per million Btu heat input).

Monitoring/Recordkeeping [15A NCAC 2Q .0508(f) and 15A NCAC 2D .2601]

vi. No monitoring, recordkeeping, or reporting is required for sulfur dioxide emissions from the firing of natural gas or No. 2 fuel oil in any boiler or heater.

c. 15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS

i. Visible emissions from any of the natural gas-fired and/or No. 2 fuel oil fired units shall not be more than 20 percent opacity when averaged over a six-minute period. However, six-minute averaging periods may exceed 20 percent not more than once in any hour and not more than four times in any 24-hour period. In no event shall the six-minute average exceed 87 percent opacity. [15A NCAC 02D .0521 (d)]

Testing [15A NCAC 02D .2601]

ii. If emission testing is required, the testing shall be performed in accordance with 15A NCAC 2D .2601 and General Condition JJ. If the results of this test are above the limit given above, the Permittee shall be deemed in noncompliance with 15A NCAC 02D .0521.

iii. Monitoring/Recordkeeping/Reporting [15A NCAC 02Q .0508(f)]
No monitoring, recordkeeping, or reporting is required for visible emissions from the firing of natural gas and/or No. 2 fuel oil in any boiler or water heater.

d. PSD Evaluation for boiler in applications 2600102.12B and 12C (Boilers):
Due to the operational tempo and structure of this military facility, projects are frequently initiated and funded separately by various different tenants who all fall under the ownership of Fort Brag Army Post. These

projects are appropriated separately by Congress, the emissions are calculated separately for each funding code, and evaluated independently against the PSD major modification thresholds.

The projects with the greatest potential to emit were proposed in application 2600102.12B. Please see the calculation performed above. No PSD Avoidance conditions will need to be written for the boilers in application 2600102.12C.

C. Welding Operations:
- ES-27W
- ES-28W

1. Description:
Welding is the process by which two metal parts are joined by melting the parts at the points of contact and simultaneously forming a connection with molten metal from a consumable electrode. For example, one type of welding is fusion. In this process, the work pieces are melted together using a filter metal (i.e. consumable electrode). Arc, resistance, and oxy fuel gas are all fusion processes. Metal rods and wires are used as consumable electrodes or filler metals. Soldering involves the joining of two metals using heat and a filler metal to produce metallurgical bonds. Usually, an alloy like lead-tin is used as the filler metal.

2. Applicable Regulatory Requirements: These sources will be added to the body of the permit because the booths will emit toxic air pollutants that have been previously modeled in the zones where these sources will be located and because these booths are not subject to a MACT standard that would cover them under G.S. 143-215.107.

Emissions were calculated assuming the following:
Welding rods were assumed to be 80% consumed. In practice, often only 50-60% of the rod is consumed, as it is held by hand. The normalized emission factor presented for welding rods in the table below has been adjusted by a factor of 0.80 to account for this. Welding wires were assumed to be 100% consumed. Emissions estimates were determined by multiplying the usage rate by the listed emission factor for a particular pollutant. Annual consumption rates per booth are assumed to be 1500 lbs rod/year and 1500 lbs of wire/yr.

As demonstrated by the calculated emissions from each welding operation, these sources are insignificant in accordance with 15A NCAC 2Q .0503(8), however they will be placed into the body of the permit because of toxic air pollutant emissions.

Example calculations for Particulate using welding rods and welding wire:

$$\frac{81.60\ lbs\ PM}{1000\ lbs\ rod} \times \frac{80}{100}(\%) \times \frac{1500\ lbs\ rod}{year} = \frac{97.92\ lbs\ PM}{year} \text{ (from rods)}$$

$$\frac{81.60\ lbs\ PM}{1000\ lbs\ wire} \times \frac{100}{100}(\%) \times \frac{1500\ lbs\ wire}{year} = \frac{122.40\ lbs\ PM}{year} (\ from\ wire)$$

Total pounds of PM from the 2 welding operations:
(97.92 + 122.40) x 2 operations = 440.64 lbs of PM per year (0.22 tons/yr)

Example Manganese compounds using both welding rods and welding wire:

$$\frac{232 \times 10^{-1}\ lbs Mn}{1000\ lbs\, wire} \times \frac{100}{100}(\%) \times \frac{1500\ lbs\, wire}{year} = \frac{34.8\ lbs\, PM}{year} (wire)$$

Total pounds of Manganese compounds from the 2 welding operations:
(27.84 + 34.8) x 2 booths = 125.28 lbs of manganese per year (0.062 tons/yr)

As demonstrated by Table 3 below, the emissions from the two booths are insignificant in accordance with 15A NCAC 2Q .0503 (8). However these sources will be placed onto the permit because of the toxic air pollutant emissions and the fact that the welding booths are not regulated under a MACT standard.

Table3: Welding booths

CAS#	Compound					Emission Factor [1] (lbs/1000 lb)	Emission Factor [1] (lbs x E^{-01}/1000 lb)	Normalized Emission Factor -Rod (lb/lb)	Normalized Emission Factor -Wire (lb/lb)	Total Emissions per Booth (ton/yr)	Total Emissions (2-booths) (tons/yr)
Criteria Pollution											
Particulate Matter				Yes		81.60		0.06528	0.0816	0.11	0.22
Particulate Matter < 10µm				Yes		81.60		0.06528	0.0816	0.11	0.22
Metals	TAP	HAP	PAH	POM						lbs/yr	lbs/year
Chromium	No	Yes	No	Yes			25.30	0.002024	0.00253	6.83	13.7
Chromium VI	Yes	Yes	No	Yes			18.80	0.001504	0.00188	5.08	10.2
Cobalt metal	No	Yes	No	Yes			0.01	0.0000008	0.000001	0.0027	0.005
Lead	No	Yes	No	Yes			1.62	0.0001296	0.001620	0.437	0.87
Manganese compounds	Yes	Yes	No	Yes			232.0	0.01856	0.0232	62.6	125.28
Nickel metal	Yes	Yes	No	Yes			17.10	0.001368	0.00171	4.62	9.2

[1] Emission factors are taken from the US EPA AP-42, chapter 12.19, Tables 12.19-1 and 12.19-2. The rod and wire surrogate was created by taking the highest emission factor for each AP-42 identified pollutant from all rod and wire types.

The impacts from the addition of the toxic air pollutants list above will be evaluated in accordance with General Statute 143-315.107 along with the most recent facility wide toxics evaluation submitted in application 2600102.12A. These booths will be placed into the body of the permit because they were included in the toxics evaluation under G.S. 143-215.107. See Section XVIII of this review.

VII. The application was signed by an authorized official as defined by 15A NCAC 2Q .0304(j).

VIII. An air toxics review and evaluation is triggered with addition of the combustion sources (boilers, engines) and the welding operations in this application.

A toxic air pollutant evaluation is required for this facility because of the recent regulatory (15A NCAC 2Q .0701, .0702, .0706 and .0709) change (effective July 10, 2010) to remove the exemption to exclude combustion sources as emitters of toxic air pollutants. However, because the engines at this facility are subject to MACT Subpart ZZZZ and the boilers and other indirect fired heaters are subject to the Boiler MACT, Subpart DDDDD, these source will be evaluated in accordance with G.S. 143-215.107.

General Statute G.S. 143-215.107(a) was approved on June 28, 2012. This Act exempts from State Air Toxics those sources of emissions that are subject to certain Federal emissions requirements under 40 CFR Part 61 (NESHAP), Part 63 (NESHAP), or Case-by-Case MACT pursuant to 42 U.S.C. §7412(j). This evaluation is done using actual emission for existing sources and projected actual for new sources. Fort Bragg used the more conservative approach by using potential emissions to perform the evaluation except for the non-specific Chromium VI emissions in Zone B.

The Fort Bragg military base submitted application No. 2600102.12A to the DAQ on December 29, 2011. This application included a facility-wide toxics demonstration and modeling exercise. The modeling results were revised by Fort Bragg (URS consulting) on April 22, 2013 at the request of the DAQ. The facility was modeled as five separate zones, each acting as an independent facility {divided into five zones (A through E)}. As a conservative approach, the facility modeled all pollutants that were greater than 50% of their respective TPER limits. Fort Bragg used AERMOD with regulatory defaults, and with five years of DAQ processed meteorology (Raleigh, 1988-1992) to model the emissions. Adequate receptors were incorporated, along with digital elevation data, to determine maximum impacts, which occurred on or near the property lines. Based on the dispersion modeling results, the model submitted in application 2600102.12A did demonstrate compliance on a source by source basis with the AAL.

The proposed boilers, HVAC units, and heaters at this facility will be permitted to burn both No. 2 fuel oil and/or natural gas. The emergency generators, firepump, and peak shaving unit will only burn Diesel. All of the fuels were evaluated for toxic air pollutant emissions. The emission rates from this modification were combined with the previous modeling demonstration (application 2600102.12A and the subsequent revision on April 22, 2013).

The current DAQ policy is to exclude hot water heaters less than 240 gallons and comfort heaters less than 0.2 mmBtu/hour heat input in the toxics evaluation.

Toxic emissions from the combustion of Diesel fuel oil in the RICE engines:
These emissions are based on 100% operation on Diesel fuel. The DAQ emission factors from the DAQ website (http://www.daq.state.nc.us/permits/spreadsheets/) were used. For small engines (less than 600 hp), ICE2012 Revision R was used and for large engines (greater than 600 hp), LGD2012 Revision 1 was used.

Toxic emissions from the combustion of fuels in the boilers:
The DAQ emission factors from the DAQ website (http://www.daq.state.nc.us/permits/spreadsheets/) for boilers

(revision E, 2/1/2010) was used.

Toxic emissions from the welding booths:
Emission factors from US EPA AP-42 chapter 12.19-1 and 19-2 were used. The rod and wire surrogate was created by taking the highest emission factor from each identified pollutant from all rod/wire types.

Toxic emissions from the combustion of natural gas in HVAC units, and infrared heaters:
Emission factors from US EPA AP-42 chapter 1.4 "External combustion Sources for Natural gas-fired units" were used.

A summary of the toxic air emissions from all the boilers, heaters, emergency generators, firepump, welding booths, and peak shaver in application 2600102.12C (units in table = lbs/year) is listed in Table 4 of this review.

A. Example calculation (peak shaving unit) using the DAQ spreadsheet for large engines:

Formaldehyde (lbs/yr): worse case estimate using peak shaving unit at 2700 kW = 3621 hp.

$$\frac{5.52E{-}07\ lbs}{hp{-}hr}\ x\ \frac{3621\ hp}{total\ engines}\ x\ \frac{8760\ hours}{year} = \frac{17.5\ lbs\ Formaldehyde}{yr}$$

B. Example calculation (indirect fired heaters and boilers) using the DAQ spread sheet (total heat input of all natural gas-fired boilers/heaters = 12.75 mmBtu/hour and total heat input of all No. 2 fuel oil-fired boilers = 8.9 mmBtu per hour):

No. 2 fuel oil:
Formaldehyde (lbs/yr): worse case estimate using all boilers at a total of 8.9 mmBtu per hour heat input:

$$\frac{4.8E{-}02\ lbs}{1000\ gallons}\ x\ \frac{556{,}886\ gallons\ (from\ DAQ\ spreadsheet)}{year} = \frac{26.73\ lbs\ Formaldehyde}{yr}$$

Natural gas:
Formaldehyde (lbs/yr): worse case estimate using all boilers at a total of 12.75 mmBtu per hour heat input.

$$\frac{7.35E{-}05\ lbs}{1{,}000{,}000\ Btu}\ x\ \frac{12.75E{+}6\ Btu}{hour}\ x\ \frac{8760\ hours}{year} = \frac{8.21\ lbs\ Formaldehyde}{yr}$$

C. Example calculation of the emergency generators and fire pump using the DAQ spread sheet for small engines (total hp of all engines = 377 hp):

Formaldehyde (lbs/yr): worse case estimate using all engines at a total of 377 hp.

$$\frac{8.26E{-}06\ lbs}{hp{-}hr}\ x\ \frac{377\ hp}{total\ engines}\ x\ \frac{500\ hours}{year} = \frac{1.56\ lbs\ Formaldehyde}{yr}$$

D. Example calculation of all of the external combustion units (roof top units, HVAC units, Infrared heaters) with total heat input of ≈ 35 mmBtu per hour heat input. This list does not include heaters with less than 0.2 mmBtu per hour heat input.

Formaldehyde (lbs/yr): worse case estimate using external combustion units at 35 mmBtu per hour heat input.

$$\frac{35E{+}06\ Btu}{hr}\ x\ \frac{scf}{1031\ Btu} = \frac{33{,}948\ scf}{hour}$$

$$\frac{7.5E{-}02\ lbs}{1E{+}06\ scf}\ x\ \frac{33{,}948\ scf}{hours}\ x\ \frac{8760\ hours}{year} = \frac{22.30\ lbs\ Formaldehyde}{yr}$$

Table 4: Summary of toxic air emissions from sources proposed in application 2600102.12C

Pollutant	Boilers/hot water htrs Nat. gas	Boilers, No. 2 fuel	HVAC units & Heaters	Emer. Gen./Fire pump	Welding booths (2)	Peak shaver	Total (lbs/yr)
Acetaldehyde	----------	----------	----------	1.01 lbs/yr	----------	5.6 lbs/yr	6.61
Acrolein	----------	----------	----------	0.122 lbs/yr	----------	1.75 lbs/yr	1.87
Arsenic	0	0.31 lbs/yr	0.06 lbs/yr	0.005 lbs/yr	----------	0.89 lbs/yr	1.27
Benzene	0.23 lbs/yr	1.53 lbs/yr	0.62 lbs/yr	1.23 lbs/yr	----------	172 lbs/yr	175.61
Benzo (a) pyrene	1.31E-04 lbs/yr	----------	0	2.48E-04 lbs/yr	----------	0.06 lbs/yr	0.06
Beryllium	----------	0.23 lbs/yr	0	3.96E-03 lbs/yr	----------	0.67 lbs/yr	0.904
1,3-Butadiene	----------	----------	----------	5.6E-02 lbs/yr	----------	----------	5.6E-02
Cadmium	----------	0.23 lbs/yr	0.33 lbs/yr	3.96E-03 lbs/yr	----------	0.67 lbs/yr	1.23
Chromium VI (non-specific)	----------	----------	----------	----------	10.2 lbs/yr	--------	10.2
Chromium VI (chromic acid)	----------	----------	----------	3.96E-03 lbs/yr	----------	0.67 lbs/yr	0.674
Flourides	----------	21.0 lbs/yr	----------	----------	----------	----------	21.0
Formaldehyde	8.21 lbs/yr	27.0 lbs/yr	22.30 lbs/yr	1.56 lbs/yr	----------	17.5 lbs/yr	76.57
Manganese	----------	0.47 lbs/yr	0.11 lbs/yr	7.92E-03 lbs/yr	125.2 lbs/yr	1.33 lbs/yr	127.11
Mercury	----------	0.23 lbs/yr	0.08 lbs/yr	3.96E-03 lbs/yr	----------	0.67 lbs/yr	0.98
Methyl chloroform 1,1,1 trichloroethane	----------	0.13 lbs/yr	----------	----------	----------	----------	0.13
Nickel	----------	0.23 lbs/yr	0.62 lbs/yr	3.96E-03 lbs/yr	9.24 lbs/yr	0.67 lbs/yr	10.76
n-Hexane	197 lbs/yr	----------	533.6 lbs/yr	----------	----------	----------	730.60
Toluene	0.37 lbs/yr	44.0 lbs/yr	1.01 lbs/yr	0.54 lbs/yr	----------	62.4 lbs/yr	108.32
Xylene (mixed isomers)	----------	----------	----------	0.38 lbs/yr	----------	42.9 lbs/yr	43.28

The emission rates of toxic air pollutants from the proposed modifications at the Fort Bragg military facility in Cumberland County have been reviewed by the DAQ. As stated earlier in this review, Fort Bragg modeled facility wide for the toxic air pollutants at this facility. This modeling exercise was revised on April 22, 2013 and is included in this review as Attachment "A". This revision included an emissions analysis and maps of the proposed permitted sources locations. All of the proposed new sources in this application are to be located in Zones A or B. The potential emissions from the proposed sources were added to the total emissions modeled in

the most recent toxic air pollutant analysis and evaluated against their respective AAL values for the appropriate averaging periods.

Table 5: Summary of toxic air emissions evaluation from proposed sources using the more conservative values from application 2600102.12C, Zone A

Pollutant	2011 Modeled emission rate	Increase per 2600102.12C		% of AAL	Unacceptable risk to human Health
Acrolein	0.01 lbs/hr	0.0		0.20%	No
Benzene	670.76 lbs/yr	186.09 lbs/yr		2.52%	No
Beryllium	19.30 lbs/yr	0.95 lbs/yr		1.12%	No
1,3-Butadiene	14.64 lbs/yr	0.25 lbs/yr		0.01 %	No
Cadmium	29.96 lbs/yr	1.12 lbs/yr		1.28%	No
Chromium VI (non-specific)	10.24 lbs/yr	5.08 lbs/yr		41.64%	No
Formaldehyde	0.55 lbs/hr	0.04 lbs/hr		0.54%	No
Manganese	12.96 lbs/day	1.06 lbs/day		1.07%	No
Mercury	0.14 lbs/day	0.01 lbs/day		0.76%	No
Nickel	1.12 lbs/day	0.08 lbs/day		0.41%	No
n-Hexane	106.43 lbs/day	0.76 lbs/day		0.14%	No
Toluene	121.20 lbs/hr	0.02 lbs/hr		2.15%	No
	415.01 lbs/day	0.55 lbs/day		0.31%	No
Xylene (mixed isomers)	89.11 lbs/hr	0.02 lbs/hr		1.39%	No
	301.54 lbs/day	0.37 lbs/day		0.41%	No

Table 6: Summary of toxic air emissions evaluation from proposed sources using the more conservative values from application 2600102.12C, Zone B

Pollutant	2011 Modeled emission rate	Increase per 2600102.12C		% of AAL	Unacceptable risk to human Health
Benzene	5.24 lbs/yr	0.30 1bs/yr		0.15%	No
Beryllium	1.63 lbs/yr	0.0 lbs/yr		0.17%	No
Cadmium	2.18 lbs/yr	0.16 lbs/yr		0.20%	No
* Chromium VI (non-specific)	2.43 lbs/yr	10.2 lbs/yr		95.18%	No – using potential emissions
	Less than 1 lb/year	Less than 1 lb/yr		0.01%	No – using actual and projected actual emissions
Formaldehyde	0.0 lbs/hr	0.04 lbs/hr		0.44%	No
Manganese	4.29 lbs/day	1.04 lbs/day		1.93%	No
Nickel	0.42 lbs/day	0.08 lbs/day		0.86%	No
n-Hexane	33.07 lbs/day	0.71 lbs/day		0.35%	No
Toluene	285.11 lbs/day	0.00 lbs/day		0.80%	No
	85.51 lbs/hr	0.0lbs/hr		4.71%	No

The facility-wide modeling effort that was submitted in application 2600102.12A and the subsequent revision dated April 22, 2013 were performed using potential emissions from the existing and new sources except for non-specific Chromium VI. Due to the conservatism of this modeling effort, the output results are much higher than would be expected if the modeling was performed based on actual emissions, as allowed by the DAQ.

* For non-specific Chromium VI (resulting from the surface coating and welding operations) an evaluation was done with both potential emissions and projected actual emissions for the sources in Zone B.

The North Carolina Division of Air Quality's air toxics program is a "risk-based" regulatory program designed to protect the public health by limiting emissions of toxic air pollutants from man-made sources. Air toxic pollutants emitted from this facility were evaluated using dispersion modeling. The model did demonstrate compliance on a source by source basis with the AAL. The DAQ has concluded that the addition of the proposes sources in application 2600102.12C will not present an unacceptable risk to human health based on dispersion modeling.

IX. Public Notice:

A thirty-day public notice is required at this time.

Public notice: The 30-day public notice period was from June 10, 2013 through July 10, 2013. No public comments were received for this permit application.

EPA 45 Day review: the EPA 45-Day review period was from June 10, 2013 through July 25, 2013. No public comments were received for this permit application.

X. NonAttainment:
Fort Bragg Army Post is located in Cumberland County. The current Section 107 attainment status designations for areas within the state of North Carolina are summarized in 40 CFR 81.334. Cumberland County is classified as "better than national standards" for total suspended particulates (TSP, also referred to as Particulate Matter, PM, which includes particulate matter less than 10 microns, PM10) and for sulfur dioxide (SO2). Cumberland County is designated as "unclassifiable/attainment" for carbon monoxide (CO), PM2.5 and 1-hour standard for ozone. Cumberland County is designated as "cannot be classified or better than national standards" for nitrogen dioxide (NO_2). Cumberland County is designated as "attainment" for the 8-hour standard for ozone.

XI. This facility is subject to 15A NCAC 2Q .0508(g) "Prevention of Accidental Releases". Fort Bragg submitted its Risk Management Plan (RMP) in 06/01/1999. The plan was revised in 2004 and 2010.

XII. For PSD Increment tracking purposes, the PSD Minor Source Baseline date was triggered in Cumberland County for particulate matter and SO_2 on July 26, 1978 and for NOx on August 20, 2001. The addition of the new sources in applications 2600102.12C will increase particulate matter, sulfur dioxide, and nitrogen oxide emissions.

The potential emissions (including any permitted annual limitations) have been added together for increment tracking purposes. All of the engines are subject to NSPS Subpart IIII, therefore NSPS allowable exhaust emission rates were used as the worse case emissions rates for the calculations for PM10 and NOx. AP-42 was used for SO_2 emissions calculation since the NSPS does not have an allowable emissions rate for this pollutant.

Example Calculation for generators:
NSPS allowable emission rate for NOx = 6.4 g/kW-hr
NSPS allowable emission rate for PM10 = 0.2 g/kW-hr
AP-42 emission factor for SO_2 = 1.21E-01 lbs/hp-hr

Nitrogen Oxide/Sulfur dioxide/PM10:
The total combined kW rating for all of the proposed generators is: (54 + 42 + 60 + 125 + 2700 = 2981 kW)
The total combined hp rating for all of the proposed generators is: (3998 hp)

$$\left[\frac{6.4\text{ g NOx}}{\text{kW}-\text{hour}} \times 2981\text{ kW} \times \frac{1\text{ lbs NOx}}{453.59\text{ g}}\right] = \frac{42.06\ lbs\ \text{NOx}}{\text{hour}}$$

$$\left[\frac{0.2\text{ g PM10}}{\text{kW}-\text{hour}} \times 2981\ kW \times \frac{1\text{ lbs }PM10}{453.59\text{ g}}\right] = \frac{1.31\ lbs\ PM10}{\text{hour}}$$

$$\left[\frac{1.21\text{E}^{-}01\text{ g }SO_2}{\text{hp-hour}} \times 3998\ hp \times \frac{1\text{ lbs}\,PM10}{453.59\text{ g}}\right] = \frac{1.1\,lbs\,SO_2}{\text{hour}}$$

The DAQ spread sheet for boilers was used to calculate the emissions from the boilers and indirect fired heaters firing No. 2 fuel oil (@ 8.9 mmBtu per hour total heat input) and from the boilers and indirect fired heaters firing natural gas (@ 12.75 mmBtu per hour total heat input).

Maximum hourly emissions for PSD increment tracking purposes:

Pollutant	Emergency Generators /Firepump/peak shaver	Welding operations	No. 2 fuel oil-fired boilers & indirect fired heaters	Natural gas-fired boilers & indirect fired heaters	Total Emissions
NOx	42.06 lbs/hr	----------	1.27 lbs/hr	1.25 lbs/hr	44.58 lbs/hr
PM10	1.31 lbs/hr	0.05 lbs/hr	0.21 lbs/hr	0.10 lbs/hr	1.67 lbs/hr
SO_2	1.1 lbs/hr	----------	1.35 lbs/hr	0.01 lbs/hr	2.46 lbs/hr

For PSD increment tracking purposes, the NOx emission rate is increased by 44.58 pounds per hour, the SO_2 emission rate is increased by 1.1 pounds per hour, and the PM_{10} emissions rate is increased by 1.31 pounds per hour.

XIII. The permit review and draft permit were sent to the Fayetteville Regional office and the applicant on May 1, 2013. Fort Bragg responded with comments on May 7, 2013. The Fayetteville Regional Office also responded on May 7, 2013.

XIV. Recommendations

This modification issued under section 15A NCAC 2Q .0501(c)(1) for XVII Airborne Corps and Fort Bragg, located in Fort Bragg, Cumberland County, North Carolina, has been reviewed by the DAQ to determine compliance with all procedures and requirements. The Fayetteville Regional Office did make comments on the draft permit. The DAQ has determined that this facility is complying or will achieve compliance as specified in the permit with all applicable requirements. The Fayetteville Regional Office concurs.

Issue permit No. 04379T37

ATTACHMENT G

NORTH CAROLINA DIVISION OF AIR QUALITY Air Permit Review – 1st step of a Significant Modification processed in accordance with 15A NCAC 2Q .0501(c)(2) Permit Issue Date: April 26, 2012	Region: Fayetteville Regional Office County: Cumberland NC Facility ID: 2600102 Inspector's Name: Robert Hayden Date of Last Inspection: 02/22/2011 Compliance Code: 3 / Compliance - inspection
Facility Data Applicant (Facility's Name): HQ XVIII ABN Corps & Fort Bragg Facility Address: HQ XVIII ABN Corps & Fort Bragg Director of Public Works Fort Bragg, NC 28310 SIC: 9711 / National Security NAICS: 92811 / National Security Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V	Permit Applicability (this application only) SIP: 15A 2D .0503, 2D .0516, 2D .0521, 2D .0524 2D .1100, and 2D .1111, 2Q .0702(18) NSPS: Subpart IIII NESHAP: Subpart ZZZZ, Subpart DDDDD PSD: N/A PSD Avoidance: Will be evaluated. NC Toxics: The modeling for the sources in this modification were evaluated in conjunction with the facility-wide toxic air pollutant modeling currently in the Raleigh Central Office. (Received December 29, 2011) 112(r): N/A Other: N/A

Contact Data			Application Data
Facility Contact Gary Cullen Air Program Manager IMSE-BRG-PWE Ft Bragg, NC 28310 (910) 432-8464	Authorized Contact Gregory Bean Director of PWBC IMSE-BRG-PWE, Bldg 3-1333 Butner Rd. Fort Bragg, NC 28310 (910) 396-4009	Technical Contact Gary Cullen Air Program Manager IMSE-BRG-PWE Ft Bragg, NC 28310 (910) 432-8464 gary.l.cullen4.civ@mail.mil	Application Number: 2600102.11B Date Received: 11/15/2011 Application Type: Modification Application Schedule: TV-Sign-501(c)(2) Existing Permit Data Existing Permit Number: 04379T35 Existing Permit Issue Date: October 27, 2011 Existing Permit Expiration Date: 09/30/2016

Consultant: URS Group Inc.	Contact: Gary Cullen	Phone: W: (910) 432-8464	email: gary.l.cullen4@mail.mil

Review Engineer: Booker Pullen Regional Engineer: Robert Hayden Review Engineer's Signature: Begin Date: February 14, 2012	Comments / Recommendations: Issue: 04379T36 Permit Issue Date: April 26, 2012 Permit Expiration Date: 09/30/2016

I. Introduction/Description:

Fort Bragg Army Post is home to both the 82nd Airborne Division and the XVIII Airborne Corps Headquarters. Additionally, Fort Bragg hosts the U. S. Army Special Operations Command, the U. S. Army Parachute Team (the Golden Knights), FORSCOM, and U. S. Army Reserve. The Fort Bragg Military Base is located at Building 3-1137 Butner Road, Cumberland County, Fort Bragg, North Carolina. Application No. 2600102.11B was received by the Raleigh Central Office, Division of Air Quality (DAQ) on November 15, 2011. The application was considered complete on that date. This facility is requesting a "Significant" modification {processed under the 15A NCAC 2Q .0501 (c)(2)} in this application.

This permit modification is not required to go through a 30-day public notice at this time. However, the facility will be required to resubmit an application for the sources involved in this modification within 12 months of operation and go through the 30-day public notice and the 45-day EPA review process.

II. Purpose of Application 2600102.11B:

Due to the operational tempo and structure of a military facility, projects are frequently initiated and funded separately by various different tenants who fall under the ownership of Fort Bragg Army Post. The project numbers for each of the proposed pieces of equipment in this application are shown for the purposes of evaluating PSD. The largest of these projects

is the addition of three emergency generators at the Security Operation Training Facility (SOTF), project number SF00004-1P.

II. Purpose of Application 2600102.11B: Continued
- L. Add Diesel-fired emergency generators at various locations on the Base.
- M. Add small natural gas-fired boilers and water heaters at various locations on the Base.
- N. Add one tank purging system.
- O. Add one fire pump.
- P. Add several welding shops at various locations on the Base.
- Q. Add one x-ray operation.
- R. Add storage tanks at various locations on the Base.
- S. Change the rating of emergency generators (ES-75G from 150 kW to 175 kW) and (ES-74G from 175 kW to 150 kW).
- T. Remove IES-3N, IES-80G, IES-99G, IES-01X, IES-130G, IES-03AB, IES-01PWT, IES-01WWTP, and ES-11C from the permit.
- U. Remove the option to burn on-specification used oil from all boilers.
- V. Add remediation system (IES-01RDL)
- W. Removed all emergency generators from the insignificant activities list. These are now listed in the Permit as significant sources due to MACT applicability. ID numbers were changed. (Example: IES-57G is now ES-57GI)

III. The modifications to the Fort Bragg Title V Air Permit will include the following:

Table 1 Addition of sources to the Permit

ID Number	Building/Description	Project No.	Description
ES-95G	SOFT/emergency generator	SF00004-1P	1,230 kW Diesel-fired emergency generator
ES-96G	SOFT/emergency generator	SF00004-1P	1,230 kW Diesel-fired emergency generator
ES-97G	SOFT/emergency generator	SF00004-1P	1,230 kW Diesel-fired emergency generator
ES-98G	SOFT/emergency generator	PN60821	1,000 kW Diesel-fired emergency generator
ES-01TP	CWF/tank Purging	FW00154-0	Tank purging system
ES-601B	Warrior in Transition	PN697798	2.0 mmBtu/hr natural gas-fired boiler
ES-602B	Warrior in Transition	PN697798	2.0 mmBtu/hr natural gas-fired boiler
ES-603B	SOF Bn HQ	PN66227	1.2 mmBtu/hr natural gas-fired boiler
ES-604B	SOF Bn HQ	PN66227	1.2 mmBtu/hr natural gas-fired boiler
ES-605B	SOF Bn HQ	PN66227	1.0 mmBtu/hr natural gas-fired water heater
ES-606B	SOF Bn HQ	PN66227	1.0 mmBtu/hr natural gas-fired water heater
ES-607B	108th ADA Bde HQ	PN68921	0.4 mmBtu/hr natural gas-fired boiler
ES-608B	108th ADA Bde HQ	PN68921	0.4 mmBtu/hr natural gas-fired boiler
ES-609B	108th ADA Bde HQ	PN68921	0.2 mmBtu/hr natural gas-fired water heater
ES-610B	E-1944; 3rd SFG HQ	PN61874	0.2 mmBtu/hr natural gas-fired water heater
ES-611B	E-1944; 3rd SFG HQ	PN61874	0.2 mmBtu/hr natural gas-fired water heater
ES-612B	E-1944; 3rd SFG HQ	PN61874	1.5 mmBtu/hr natural gas-fired boiler
ES-613B	Troop & Family Medical Clinic	PN64244	0.14 mmBtu/hr natural gas-fired humidifier
ES-614B	Troop & Family Medical Clinic	PN64244	0.14 mmBtu/hr natural gas-fired humidifier
ES-615B	Troop & Family Medical Clinic	PN64244	0.2 mmBtu/hr natural gas water heater (100 gallons)
ES-616B	Troop & Family Medical Clinic	PN64244	0.2 mmBtu/hr natural gas water heater (100 gallons)
ES-617B	Troop & Family Medical Clinic	PN64244	0.6 mmBtu/hr natural gas-fired boiler
ES-618B	Troop & Family Medical Clinic	PN64244	0.6 mmBtu/hr natural gas-fired boiler
ES-619B	SOF Training Facility	PN43055	0.15 mmBtu/hr natural gas-fired boiler
ES-620B	SOF Communications Training	PN60272	1.75 mmBtu/hr natural gas-fired boiler
ES-621B	82nd HQ	PN44968	2.04 mmBtu/hr natural gas-fired boiler
ES-622B	82nd HQ	PN44968	2.04 mmBtu/hr natural gas-fired boiler
ES-623B	Z-3252	J400001-1P	0.7 mmBtu/hr natural gas-fired heater

ES-624B	Behavioral Medical Clinic	PN69353	0.3 mmBtu/hr natural gas-fired water heater (130 gallons)
ES-625B	Behavioral Medical Clinic	PN69353	0.3 mmBtu/hr natural gas-fired water heater (130 gallons)

Table 1 (Continued)

ID Number	Building/Description	Project No.	Description
ES-626B	Behavioral Medical Clinic	PN69353	1.0 mmBtu/hr natural gas-fired boiler
ES-627B	Behavioral Medical Clinic	PN69353	1.0 mmBtu/hr natural gas-fired boiler
ES-628B	SOF Squadron HQ Addition	PN60821	0.4 mmBtu/hr natural gas-fired boiler
ES-629B	SOF Squadron HQ Addition	PN60821	0.4 mmBtu/hr natural gas-fired boiler
ES-630B	Battle Command Training Center - USASOC	PN76958	0.27 mmBtu/hr natural gas-fired heater
ES-631B	Battle Command Training Center - USASOC	PN76958	0.27 mmBtu/hr natural gas-fired heater
ES-632B	Battle Command Training Center - USASOC	PN76958	0.27 mmBtu/hr natural gas-fired heater
ES-633B	Battle Command Training Center - USASOC	PN76958	0.27 mmBtu/hr natural gas-fired heater
ES-634B	Battle Command Training Center - USASOC	PN76958	0.09 mmBtu/hr natural gas-fired heater
ES-635B	Battle Command Training Center - USASOC	PN76958	0.09 mmBtu/hr natural gas-fired heater
ES-636B	Battle Command Training Center - USASOC	PN76958	0.09 mmBtu/hr natural gas-fired heater
ES-637B	Battle Command Training Center - USASOC	PN76958	0.45 mmBtu/hr natural gas-fired boiler
ES-638B	Battle Command Training Center - USASOC	PN76958	0.45 mmBtu/hr natural gas-fired boiler
ES-639B	A-6399	N/A	0.5 mmBtu/hr natural gas-fired dryer
ES-145GI	ATF	SC00008-1	600 kW diesel-fired emergency generator
ES-146GI	O-1900N; SOF Operations Support Additions	PN64669	500 kW diesel-fired emergency generator
ES-147GI	182	13MP	125 kW diesel-fired emergency generator
ES-148GI	731	13MP	125 kW diesel-fired emergency generator
ES-149GI	SOFT Antennae Field	SF00006-0P	150 kW diesel-fired emergency generator
ES-150GI	4-2924/Biosafety Lab	N/A	200 kW diesel-fired emergency generator
ES-151GI	141/143 Pope AAF	PN79655	100 kW diesel-fired emergency generator
ES-152GI	ATCT Pope AAF	PN63006	350 kW diesel-fired emergency generator
ES-153GI	0-5040 F-Mag#3	PN68818	100 kW diesel-fired emergency generator
ES-154GI	0-5040 F-Mag#7	PN68818	100 kW diesel-fired emergency generator
ES-155GI	0-5020 Entry control Bldg, South	PN68818	20 kW diesel-fired emergency generator
ES-156GI	New ASP ACP	PN68818	20 kW diesel-fired emergency generator
ES-157GI	0-5036 Oval #2	PN68818	20 kW diesel-fired emergency generator
ES-158GI	Ammo Holding Area	PN68818	20 kW diesel-fired emergency generator
ES-159GI	SOF Squadron HQ Addition	PN60821	100 kW diesel-fired emergency generator
ES-16FPATF	SOF Training Support Building (ATF)	PN77498	117 kW diesel-fired fire pump
IES-01RDL	771	N/A	Remediation Site with Air Stripper
IES-13W	558	N/A	Welding Shop
IES-14W	562	N/A	Welding Shop
IES-15W	A2206	N/A	Welding Shop
IES-16W	A2905	N/A	Welding Shop
IES-17W	A3804	N/A	Welding Shop
IES-18W	A4326	N/A	Welding Shop
IES-19W	A4333	N/A	Welding Shop

IES-20W	A4521	N/A	Welding Shop
IES-21W	M-8139	N/A	Welding Shop
IES-03T558A	558	N/A	2000 gallon E-85 storage tank
IES-03T558B	558	N/A	1000 gallon E-85 storage tank
IES-03T625	625	N/A	1000 gallon gasoline storage tank
IES-02X	731	N/A	X-ray Operation

IV. Changes to existing permit per application 2600102.11B:

Old Page No.	New Page No.	Condition No.	Changes
Cover Letter			
Page 1	Page 1	Heading and body of letter	Revised issue date, revised permit number, changed "complete application" received date, revised the "one" year re-submittal paragraph
Page 2	Page 2	Heading and body of letter	Revised issued date at the top of letter, and changed the effective date of permit, added NOx and PM10 hourly contributions for the addition of the new sources in this application
Page 3	Page 3	"Changes to Permit" Table	Updated the table to reflect the changes per this modification
Insignificant Activities List			
Page 1 of 6	Page 1 of 6		Removed insignificant activities: IES-80G and IES-99G from list
Page 2 of 6	Page 2 of 6		Removed insignificant activities: IES-130G and IES-03AB from list. Relocated sources IES-00B (boilers, heaters) to Section 2.2 O. [112(j)] of the permit.
Page 3 of 6	Page 4 of 6		Added insignificant activities IES-03T558A, 03T558B, and 03T625
Page 4 of 6	Page 4 of 6		Removed insignificant activities: IES-03N from list
Page 5 of 6	Page 5 of 6		Removed insignificant activities: IES-01PWT, IES-01WWTP, IES-01X FROM list. Added IES-02X.
Page 6 of 6	Page 6 of 6		Added insignificant activity: IES-01RDL
Changes to Body of Permit			
Page 1	Page 1	Cover Page	Changed issue date, changed "replaces permit revision number, changed effective date, changed application number, changed complete application date,
All pages	All pages	Page heading	Changed permit revision number to T36
Page 3	Page 3	Specific Limitations and Conditions	Removed the option to burn on-specification No. 2 fuel oil from boilers ES-11B, 12B, 24B, 25B, 26B, 29B, and 35B
Page 4	Page 4-5		Added boilers and heaters that are subject to the boiler MACT
Page 6	Page 7		Changed rating of ES-74G from 175 kW to 150 kW and changed the rating of ES-75G from 150 kW to 175 kW
Page 7	N/A		Removed ES-11C from permit, added generators ES-95G through ES-98G
Page 21	N/A		Removed the option to burn on-specification No. 2 fuel oil from boilers ES-29B
Page 37	Page 44		Changed rating of ES-74G from 175 kW to 150 kW and changed the rating of ES-75G from 150 kW to 175 kW
Page 50	N/A	Multiple Emissions	Removed Multiple Emissions Section A. 1 through 4 because the option to burn on-specification No. 2 fuel oil has been removed from the permit.
Page 62	Page 69		Changed rating of ES-74G from 175 kW to 150 kW and removed IES-130G from the permit
Page 67	N/A		Removed IES-80G and IES-99G from the permit

Page 74	Page 81-82		Changed rating of ES-75G from 150 kW to 175 kW, added ES-95 through ES-98 to NSPS list. Added all generators previously listed on insignificant list, that are now also subject to the RICE MACT to the NSPS list.
Page 75	Page 83		Added date for 112(j) condition
N/A	Pages 84-85		Added Boiler MACT conditions
N/A	Pages 87-96	General Conditions	Added current version of General Conditions

V. Statement of Compliance:

The DAQ has reviewed the compliance status of this facility. Mr. Robert Hayden of the FRO, performed a facility inspection on February 22, 2011 and the facility appeared to be in compliance with all applicable requirements.

VI. Source-by Source Evaluation for Modification Revision T37:

A. Project No. SF0000401P is for the installation of three 1,230 kW Diesel-fired emergency generators (ES-95G, 96G, and 97G) at the Security Operations training Facility (SOFT). Project No. PN60821 is for the installation of one 1,000 kW Diesel fuel-fired emergency generator for the SOF headquarters.

Internal Combustion Engines (compression ignition) greater than 500 horsepower (Diesel Fuel-Fired Emergency Generators):

- ES-95G (Diesel fuel-fired, 1,230 kW, 1649 hp)
- ES-96G (Diesel fuel-fired, 1,230 kW, 1649 hp)
- ES-97G (Diesel fuel-fired, 1,230 kW, 1649 hp)
- ES-98G (Diesel fuel-fired, 1,000 kW, 1341 hp)
- ES-145GI (Diesel fuel-fired, 600 kW, 804.6 hp)
- ES-146GI (Diesel fuel-fired, 500 kW, 670.5 hp)

1. Description:
   These emergency generators are fired by Diesel fuel only. The maximum operation of each emergency generator shall not exceed 500 hours per the 1995 EPA guidance from John S. Seitz, Director of the Office of Air Quality Planning and Standards. Emissions from the generators are uncontrolled.

2. Applicable Regulatory Requirements: This facility has already triggered a facility wide toxics evaluation and has performed modeling in accordance with Section 2.3 of the Air Permit revision T35. The facility wide toxics demonstration and modeling was submitted on December 29, 2011. Under the current regulatory requirements, when the permit for the facility-wide toxics evaluation is processed, these engines along with all the other combustion sources will then be removed from the insignificant activities list and placed into the body of the Air Permit.

   NSPS, Subpart IIII, does apply to each of these generators. They are also subject to MACT, Subpart ZZZZ. Subpart ZZZZ was revised, and re-published in the Federal Register on January 18, 2008 with an effective date of March 18, 2008. This revision included engines with capacities greater than 500 brake horsepower and engines with capacities less than 500 brake horsepower located at major sources of HAP emissions.

   Per 40 CFR §63.6590(a)(2)(i), a stationary RICE with a capacity greater than 500 brake horsepower located at a major source of HAP emissions is considered new if it commenced construction (on-site fabrication) on or after December 19, 2002.

   Per 40 CFR §63.6590(b)(i) "Stationary RICE Subject to Limited Requirements" a new emergency generator with a site rating greater than 500 brake horsepower located at a major source of HAP emissions does not have to meet the requirements of Subpart ZZZZ or Subpart A of this part except for the initial notification requirements of 63.6645(f).

The following provides a summary of limits and/or standards for the emission sources described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Visible emissions	20 percent opacity	15A NCAC 2D .0521

Sulfur dioxide	Burn fuel that contains less than 15 parts per million sulfur content	15A NCAC 2D .0524 40 CFR Part 60 Subpart IIII
Hazardous Air Pollutants	Initial notification requirements	15A NCAC 2D .1111 40 CFR Part 63, Subpart ZZZZ
NMHC + NOx, HC, NOx, CO, PM	Purchase engine certified to meet the applicable engine design emission limits	15A NCAC 2D .0524 40 CFR Part 60 Subpart IIII
Toxic air pollutants	Evaluation required	15A NCAC 2Q .0702(18) 15A NCAC 2D .1100

a. 15A NCAC 2D .0524, NSPS, 40 CFR Part 60, Subpart IIII, "Sulfur Dioxide Emissions"

Regulation Analysis:

i. Each generator shall burn fuel that contains less than 15 parts per million sulfur content.

ii. Emergency generators may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State, or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year.

Monitoring/Recordkeeping/Reporting [15A NCAC 2Q .0508(f)]

iii. No monitoring, recordkeeping, or reporting is required for sulfur dioxide emissions from the firing of diesel fuel in any emergency generator.

b. 15A NCAC 2D .0521"Control Of Visible Emissions"

Regulation Analysis:

i. Generators will be installed after July 1, 1971, and each is therefore subject to the State regulation 15A NCAC 2D .0521(d). Per this regulation visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute periods averaging more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period for each boiler.

Compliance is expected with this regulation because all of the generators will be firing diesel fuel.

Monitoring/Recordkeeping/Reporting [15A NCAC 2Q .0508(f)]

ii. No monitoring, recordkeeping, or reporting is required for visible emissions from the firing of diesel fuel in any generator because it should always be in compliance with the opacity standard during normal operation.

c. 15A NCAC 2D .1111, 40 CFR Part 63, Subpart ZZZZ: National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines

i. General Provisions [40 CFR §63.6665]:
The Permittee shall comply with the requirements of 40 CFR part 63 Subpart A "General provisions," according to the applicability of Subpart A to such sources, as identified in Table No. 8 in Subpart ZZZZ, "Applicability Of General Provisions to Subpart ZZZZ".

ii. Compliance/Notification Procedures [40 CFR §63.6645]
Per 40 CFR §63.6590(c) "Stationary RICE Subject Regulations Under 40 CFR Part 60", new emergency compression ignition generators less than 500 brake horsepower site rating must only meet the requirements of NSPS, Subpart IIII.

Per 40 CFR §63.6590(c) "Stationary RICE Subject Regulations Under 40 CFR Part 60", new compression ignition generators less than 500 brake horsepower site rating must only meet the requirements of NSPS, Subpart IIII.

Per 40 CFR §63.6590(b)(i) "Stationary RICE Subject to limited Requirements" a new emergency generator with a site rating greater than 500 brake horsepower located at a major source of HAP

emissions does not have to meet the requirements of Subpart ZZZZ or Subpart A of this part except for the initial notification requirements of 63.6645(f)

The owner or operator of an affected source that has an initial startup before the effective date of a relevant standard under this part shall notify the Administrator in writing that the source is subject to the relevant standard. The notification, which shall be submitted not later than 120 calendar days after startup of the emergency generator and shall provide the following:

(A) The name and address of the owner or operator;
(B) The address (i.e., physical location) of the affected source;
(C) An identification of the relevant standard, or other requirement, that is the basis of the notification and the source's compliance date;
(D) A brief description of the nature, size, design, and method of operation of the source and an identification of the types of emission points within the affected source subject to the relevant standard and types of hazardous air pollutants emitted;
(E) A statement of whether the affected sources is a major source or an area source.
(F) A statement that each generator has no additional requirements and explain the basis for the exclusion (for example, that the units operate exclusively as emergency stationary RICE).

iii. Recordkeeping Requirement For Applicability Determination [40 CFR §63.10(b)(3)]
The applicability determination for exclusion of these emergency generators from the requirements of 40 CFR Part 63, Subpart ZZZZ and Subpart A of this part, shall be maintained on site for a period of 5 years after the determination, or until the source changes its operations to become an affected source, whichever comes first. The analyses, or other information, that demonstrates the exemption from the requirements of Subpart ZZZZ and part A of this subpart, shall be signed by the person making the determination.

iv. Monitoring/Reporting [15A NCAC 2Q .0508(f)]
- Owner/operators who purchase an emergency generator that is less that 30 liters per cylinder must purchase units that are certified by the manufacturer to meet the applicable engine design emission limits. {§60.4211 (c)}.
- Owners/operators must operate and maintain engines and control devices in accordance with the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the life of the engine. {§60.4206 and §60.4211 (a)}.
- No testing is required for units less than 30 liter per cylinder displacement that have been certified by the manufacturer to meet design limits.
- Install a nonresettable hour meter {§60.4209(a)}.

d. 15A NCAC 2D .0524: NSPS, Standards of Performance for Stationary compression Ignition Internal Combustion Engines [40 CFR 60 Subpart IIII], (For emergency generator units manufactured after June 12, 2006) -- HC, NOx, CO, PM

i. The Permittee shall comply with all applicable provisions, including the requirements for emission standards, notification, testing, reporting, record keeping, and monitoring, contained in Environmental Management Commission Standard 15A NCAC 2D .0524 "New Source Performance Standards (NSPS)" as promulgated in 40 CFR Part 60 Subpart IIII, including Subpart A "General Provisions." [15A NCAC 2D .0524]

Emission Standards

ii. The Permittee shall comply with the following emission standards for compression ignition (CI) engines for model year 2007 and later.

Purchase an engine certified to the emission standards in §60.4205(b) for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's specifications.

Exhaust emission standards:
HC: 1.3 g/kW-hr (1.0 g/Hp-hr)
NOx: 9.2 g/kW-hr (6.9 g/Hp-hr)

CO: 11.4 g/kW-hr (8.5 g/Hp-hr)
PM: 0.54 g/kW-hr (0.4 g/Hp-hr)
[§60.4205(b), §60.4211(c), and §89.112(a)]

iii. The Permittee shall use diesel fuel in the CI engine of each emergency generator with a sulfur content of less than 15 ppm beginning October 1, 2010. [§60.4207, and §80.510(a) and (b)]

Testing [15A NCAC 2Q .0508(f)]

iv. If emission testing is required, the testing shall be performed in accordance with General Condition JJ. If the results of this test are above the limit given above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524.

Monitoring [15A NCAC 2Q .0508(f)]

v. Owners and operators of CI internal combustion engines (ICE) must operate and maintain stationary CI ICE that achieve the emissions standards as required in §§60.4204 and 60.4205 according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engine. The Permittee may only change engine settings that are permitted by the manufacturer. The Permittee shall also meet the requirements of 40 CFR 89, 94 and/or 1068 as applicable. The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524, if the requirements in this Section are not met. [§60.4206 and §60.4211(a)]

vi. The CI emergency generator shall be equipped with a non-resettable hour meter prior to startup. If the CI engine of each emergency generator is not equipped with a non-resettable hour meter prior to startup, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524. [§60.4209(a)]

vii. The Permittee may operate the CI emergency generator for maintenance checks and readiness testing for up to 100 hours per year provided that the tests are recommended by Federal, State, or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Operation during an actual emergency shall not be subject to a limit on hours. The Permittee may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the Permittee maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. Because the Permittee is required to comply with emission standards under §60.4205 for the CI engine in the emergency generator, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524, if the requirements in this Section are not met. [§60.4211(e)]

Recordkeeping [15A NCAC 2Q .0508(f)]

viii. Starting with emergency generator model year 2011, if the emergency engine does not meet the standards applicable to non-emergency engines in the applicable model year, the Permittee shall keep records of the operation of the engine in emergency and non-emergency service that are recorded through the nonresettable hour meter. The Permittee shall record the time of operation of the engine and the reason the engine was in operation during that time. The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0524, if these records are not maintained. [§60.4214(b)]

Reporting [15A NCAC 2Q .0508(f)]

ix. No initial notification under §60.7 is required for the emergency use CI engines. [§60.4214(b)]

x. The Permittee shall submit a summary report of monitoring and recordkeeping activities postmarked on or before January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period between January and June. All instances of deviations from the requirements of this permit must be clearly identified.

e. PSD Evaluation:
The Fort Bragg facility is a major source for PSD emissions. The modifications that occur at the base shall be evaluated against the PSD significance levels. The worse case pollutant from the combustion process will be NOx with a significance level of 40 tons per year and GHGs with a significance level of 75,000 tons per year.

Green House Gases:
Currently (January 2011) the DAQ recognizes only four of the six spelled out in the Federal Register: Methane (CH_4), Carbon Dioxide (CO_2), Nitrous Oxide (N_2O), Hydrofluorocarbons (HFCs)

i. Project number SF00004-1P will add three 1,230 kW emergency generators (ES-95G, 96G, and 97G).

Since these emergency generators will be certified by the manufacturer to meet the requirements of NSPS Subpart IIII for Diesel-fired engines, the maximum NOx (worse case pollutant) emissions will be 9.2 grams/kW-hour.

The total NOx emission rate from this project is less than 40 tons per year (at 18.71 tpy). Therefore, no PSD avoidance condition needs to be written. See example calculation below.

$$\left[\frac{9.2\text{ g}}{\text{kW}-\text{hour}}\times 1{,}230\text{ kW}\times\frac{1\text{ lbs NOx}}{453.59\text{ g}}\right]\times 3\text{ engines}\times\frac{1\text{ ton}}{2000\text{ lbs}}\frac{500\text{ hrs}}{\text{year}}=\frac{18.71\text{ tons NOx}}{\text{year}}$$

The GHG emission factor (taken from 40 CFR Part 98 "Mandatory Greenhouse Gas Reporting", Subpart C, Table C-2 for Petroleum fuel types) is 73.96 kg CO_2/mmBtu. The total GHG emission rate from this project is less than 75,000 tons per year (at 1,412 tons per year). Therefore, no PSD avoidance condition for GHGs needs to be written. See example calculation below.

In accordance with EPA's AP-42 Chapter 3.3 (Table 3.3-1; Reference a), an average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr was used to convert from lb/mmBtu to lb/hp-hr when necessary.

$$\frac{73.96\ kg\ CO_2}{1\times10^6\ Btu}\times\frac{1000\ g}{kg}\times\frac{1\ lb}{453.59\ g}\times\frac{7000\ Btu}{hp-hr}=\frac{1.14\ lbs\ CO_2}{hp-hr}$$

$$\left[\frac{1.1413\ lbs\,CO_2}{\text{hp-hr}}\times 1{,}649\ hp\right]\times 3\text{ engines}\times\frac{1\text{ ton}}{2000\text{ lbs}}\times\frac{500\text{ hrs}}{\text{year}}=\frac{1{,}412\text{ tons}CO_2}{\text{year}}$$

Methane and Nitrous oxide emissions emit less than 0.07 tons per year total.

B. The boilers, indirect-fired humidifiers, and water heaters listed in Sections III., Table 1 above in this review are evaluated below. The heat input from all 39 units (ID Nos. ES-601B through ES-639B) will be reviewed in accordance with 15A NCAC 2D .0503.

1. Description: All of the boilers, humidifiers, and water heaters at Fort Bragg are used for domestic purposes only and not to heat process water. Historically the Division of Air Quality has permitted comfort heat boilers at military bases and universities because of the size and the large number of boilers. The units at military bases are usually funded separately under a variety of projects and are therefore evaluated by the separately funded projects.

   The boilers, humidifiers, and water heaters subject to the Boiler MACT that are listed in the table in Section III of this review will be added to the permit as new sources.

2. Applicable Regulatory Requirements: Even though these boilers qualify for the insignificant activities list, they are still subject to 15A NCAC 2D .0503, .0516, and .0521. NSPS Subpart Dc does not apply because each of the units is less than 10 million Btu per hour heat input. When Fort Bragg submits their facility wide toxics demonstration as a result of the recent removal of the combustion source exemption for toxic air pollutant review, these boilers will be added to the table of permitted sources and the Multiple Emissions "Air Toxic Modeling" Section of the Tile V Permit.

   15A NCAC 2D .1111 "Boiler MACT, Subpart DDDDD" will apply to the boilers in the projects in this modification because they will commence construction after June 4, 2010. For all new units with a heat

input capacity less than 10 million British thermal units per hour (mmBtu/hr), the final rule establishes a work practice standard instead of numeric emission limits. The operator will be required to perform a tune-up for each unit once every 2 years. Continuous compliance will be demonstrated in accordance with 40 CFR 63.7540 (a)(10)(i) through (a)(10)vi). This regulation does not apply to hot water heaters that are heated by gaseous or liquid fuel with a capacity of no more than 120 US gallon capacity.

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Particulate matter	0.18 lbs per million Btu heat input	15A NCAC 2D .0503
Sulfur dioxide	2.3 pounds per million Btu heat input	15A NCAC 2D .0516
Visible emissions	20 percent opacity	15A NCAC 2D .0521
Toxic air pollutants	Evaluation required	15A NCAC 2D .0702(18) 15A NCAC 2D .1100
HAPS	Work practice standards	15A NCAC 2D .1111 Subpart DDDDD

Because these boilers are not subject to NSPS Subpart Dc (heat inputs less than 10 million Btu per hour), particulate emission rates will have allowable emission rates in accordance with 15A NCAC 2D .0503 (e). Per this regulation, the maximum heat input shall be the total heat content of all fuels that are burned in a fuel burning indirect heat exchanger, of which the combustion products are emitted through a stack or stacks. The sum of maximum heat input of all fuel burning indirect heat exchangers at a plant site that are in operation, under construction, or permitted pursuant to 15A NCAC 2Q, shall be considered as the total heat input for the purpose of determining the allowable emission limit for particulate matter for each fuel burning indirect heat exchanger. Fuel burning indirect heat exchangers constructed or permitted after February 1, 1983, shall not change the allowable emission limit of any fuel burning indirect heat exchanger whose allowable emission limit has previously been set.

The removal of a fuel burning indirect heat exchanger shall not change the allowable emission limit of any fuel burning indirect heat exchanger whose allowable emission limit has previously been established. However, for any fuel burning indirect heat exchanger constructed after, or in conjunction with, the removal of another fuel burning indirect heat exchanger at the plant site, the maximum heat input of the removed fuel burning indirect heat exchanger shall no longer be considered in the determination of the allowable emission limit of any fuel burning indirect heat exchanger constructed after or in conjunction with the removal.

a. 15A NCAC 2D .0503: PARTICULATES FROM FUEL BURNING INDIRECT HEAT EXCHANGERS

vii. Emissions of particulate matter from the combustion of natural gas that are discharged from these sources into the atmosphere shall not exceed 0.182 pounds per million Btu heat input. [15A NCAC 2D .0503(a)]

Boilers currently permitted at Fort Bragg and the new boilers per this application:

Boiler ID No.	mmBtu/hr heat input rating	Type of fuel	Comments
Indirect-fired boilers, and water heaters currently at facility	970.1 mm/Btu hr	Natural gas, No. 2 fuel oil, recycled No. 2 fuel oil, Diesel fuel	Currently permitted in Revision T36
ES-601B	2.0 mmBtu/hr	Natural gas-fired	Added in Permit Revision T37
ES-602B	2.0 mmBtu/hr	Natural gas-fired	
ES-603B	1.2 mmBtu/hr	Natural gas-fired	
ES-604B	1.2 mmBtu/hr	Natural gas-fired	
ES-605B	1.0 mmBtu/hr	Natural gas-fired	
ES-606B	1.0 mmBtu/hr	Natural gas-fired	
ES-607B	0.4 mmBtu/hr	Natural gas-fired	
ES-608B	0.4 mmBtu/hr	Natural gas-fired	
ES-609B	0.2 mmBtu/hr	Natural gas-fired	
ES-610B	0.2 mmBtu/hr	Natural gas-fired	

Boilers currently permitted at Fort Bragg and the new boilers per this application: Continued

Boiler ID No.	mmBtu/hr heat input rating	Type of fuel	Comments
ES-611B	0.2 mmBtu/hr	Natural gas-fired	Added in Permit Revision T37
ES-612B	1.5 mmBtu/hr	Natural gas-fired	
ES-613B	0.14 mmBtu/hr	Natural gas-fired	
ES-614B	0.14 mmBtu/hr	Natural gas-fired	
ES-615B	0.2 mmBtu/hr	Natural gas-fired	
ES-616B	0.2 mmBtu/hr	Natural gas-fired	
ES-617B	0.6 mmBtu/hr	Natural gas-fired	
ES-618B	0.6 mmBtu/hr	Natural gas-fired	
ES-619B	0.15 mmBtu/hr	Natural gas-fired	
ES-620B	1.75 mmBtu/hr	Natural gas-fired	
ES-621B	2.04 mmBtu/hr	Natural gas-fired	
ES-622B	2.04 mmBtu/hr	Natural gas-fired	
ES-623B	0.7 mmBtu/hr	Natural gas-fired	
ES-624B	0.3 mmBtu/hr	Natural gas-fired	
ES-625B	0.3 mmBtu/hr	Natural gas-fired	
ES-626B	1.0 mmBtu/hr	Natural gas-fired	
ES-627B	1.0 mmBtu/hr	Natural gas-fired	
ES-628B	0.4 mmBtu/hr	Natural gas-fired	
ES-629B	0.4 mmBtu/hr	Natural gas-fired	
ES-630B	0.27 mmBtu/hr	Natural gas-fired	
ES-631B	0.27 mmBtu/hr	Natural gas-fired	
ES-632B	0.27 mmBtu/hr	Natural gas-fired	
ES-633B	0.27 mmBtu/hr	Natural gas-fired	
ES-634B	0.09 mmBtu/hr	Natural gas-fired	
ES-635B	0.09 mmBtu/hr	Natural gas-fired	
ES-636B	0.09 mmBtu/hr	Natural gas-fired	
ES-637B	0.45 mmBtu/hr	Natural gas-fired	
ES-638B	0.45 mmBtu/hr	Natural gas-fired	
ES-639B	0.5 mmBtu/hr	Natural gas-fired	
Total for this modification = 26.01 mmBtu/hr			
Total heat input at the facility = 970.1 + 26.01 = 996.11 mmBtu/hr heat input			

$E = 1.090 \times Q^{-0.2594}$ Where: E = allowable PM emission rate in lbs/mmBtu heat input
Q = maximum heat input rate in million Btu per hour

$E = 1.090 \times Q^{-0.2594}$
$E = 1.090 \times (996.11)^{-0.2594}$
$E_{allow} = 0.182$ pounds PM per million Btu heat input

Example calculation: All 39 indirect-fired units firing natural gas only.

The particulate matter emission rate from the burning of natural gas in any boiler was estimated using AP-42 factors, Supplement E, revised 9/98, a heating value of 1020 Btu per cubic foot of natural gas.

$$\frac{7.6\ lbs\ PM}{10^6\ cubic\ \ feet} \times \frac{1\ cubic\ \ foot\ \ natural\ \ gas}{1020\ Btu} \times \frac{10^6\ Btu}{million\ Btu} = 0.0074\ \frac{lbs\ PM}{million\ Btu}$$

Compliance is indicated when any of the boilers burn natural gas, since the actual emission rate (0.0074 lbs PM million Btu heat input) is less than the allowable emission rate (0.183 lbs PM per million Btu heat input).

Testing [15A NCAC 2D .0501(c)(3)]

ii. If emission testing is required, the testing shall be performed in accordance General Condition JJ located in Section 3 of the Air Permit. If the results of this test are above the limit given in Section VI. C. 2. a. i. above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0503.

Monitoring [15A NCAC 2Q .0508(f)]

iii. No monitoring, recordkeeping, or reporting is required for particulate emissions from the firing of natural gas in any boiler.

b. 15A NCAC 2D .0516: SULFUR DIOXIDE EMISSIONS FROM COMBUSTION SOURCES

i. Emissions of sulfur dioxide from these sources shall not exceed 2.3 pounds per million Btu heat input. Sulfur dioxide formed by the combustion of sulfur in fuels, wastes, ores, and other substances shall be included when determining compliance with this standard. [15A NCAC 02D .0516]

Testing [15A NCAC 2D .2601]

ii. If emission testing is required, the testing shall be performed in accordance with 15A NCAC 2D .2601 and General Condition JJ found in Section 3 of the Permit. If the results of this test are above the limit given in Section V. 2. b. i. above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0516.

$$\frac{0.6\ lbs\ SO_2}{10^6\ cubic\ \ feet\ natural\ \ gas} \times \frac{1\ cubic\ \ foot\ natural\ \ gas}{1020\ Btu} \times \frac{10^6\ Btu}{million\ Btu} = 0.00058\ \frac{lbs\ PM}{million\ Btu}$$

Compliance is indicated when any boiler burns natural gas since the actual emission rate (0.00058 lbs SO_2 million Btu heat input) is less than the allowable emission rate (2.3 lbs SO_2 per million Btu heat input).

Monitoring/Recordkeeping [15A NCAC 2Q .0508(f) and 15A NCAC 2D .2601]

vii. No monitoring, recordkeeping, or reporting is required for sulfur dioxide emissions from the firing of natural gas in any boiler.

c. 15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS

i. Visible emissions from any of the natural gas-fired units shall not be more than 20 percent opacity when averaged over a six-minute period. However, six-minute averaging periods may exceed 20 percent not more than once in any hour and not more than four times in any 24-hour period. In no event shall the six-minute average exceed 87 percent opacity. [15A NCAC 02D .0521 (d)]

Testing [15A NCAC 02D .2601]

ii. If emission testing is required, the testing shall be performed in accordance with 15A NCAC 2D .2601 and General Condition JJ. If the results of this test are above the limit given in Section V. C. 2. c. i. above, the Permittee shall be deemed in noncompliance with 15A NCAC 02D .0521.

iii. Monitoring/Recordkeeping/Reporting [15A NCAC 02Q .0508(f)]
No monitoring, recordkeeping, or reporting is required for visible emissions from the firing of natural gas in any boiler.

d. PSD Evaluation:

Due to the operational tempo and structure of this military facility, projects are frequently initiated and funded separately by various different tenants who all fall under the ownership of Fort Brag Army Post. These projects are appropriated separately by Congress, the emissions are calculated separately for each funding code, and evaluated independently against the PSD major modification thresholds.

Fort Bragg is currently a major source for PSD. As such, the emissions from new modifications are evaluated against the PSD Significance levels. Even if the boilers, humidifiers, and water heaters were to be considered one project, the total heat input for all of the boilers would 26.01 mmBtu per hour. No PSD avoidance condition is required for any of these projects. No further PSD analysis needs to be performed.

Example calculation using a theoretical 26.01 mmBtu per hour heat input

$$\frac{100\ lbs\ NOx}{10^6\ ft^3\ natural\ gas} \times \frac{1\ ft^3 natural\ gas}{1020\ Btu} \times \frac{26.01 \times 10^6\ Btu}{hour} \times \frac{1 ton\ NOx}{2000\ lbs\ NOx} \times \frac{8760\ hours}{year} = 11.17\ \frac{tons\ NOx}{year}$$

Pollutant	Emission Rate From a Combined heat of 90 mmBtu per hour (tpy)	PSD Major Significance Level (tons/yr)	Review Required (Yes/No)
NOx	11.17 tpy	40	No
PM (TSP)	Less than significance level	25	No
PM_{10}	Less than significance level	15	No
$PM_{2.5}$	Less than significance level	15	No
SO_2	Less than significance level	40	No
CO	Less than significance level	100	No
VOCs	Less than significance level	40	No
Lead	Less than significance level	0.6	No

C. Internal Combustion Engines less than 500 horse power (Diesel fuel-fired emergency generators) and Diesel fuel-fired fire pump:

- ES-147GI (Diesel fuel-fired, 125 kW, 167.6 hp) – Project No. 13MP
- ES-148GI (Diesel fuel-fired, 125 kW, 167.6 hp) – Project No. 13MP
- ES-149GI (Diesel fuel-fired, 150 kW, 201.15 hp) – Project No. SF00006-0P
- ES-150GI (Diesel fuel-fired, 200 kW, 268.2 hp)
- ES-151GI (Diesel fuel-fired, 100 kW, 134.1 hp) – Project No. 79655
- ES-152GI (Diesel fuel-fired, 350 kW, 469.4 hp) – Project No. 63006
- ES-153GI (Diesel fuel-fired, 100 kW, 134.1 hp) – Project No. 68818
- ES-154GI (Diesel fuel-fired, 100 kW, 134.1 hp) – Project No. 68818
- ES-155GI (Diesel fuel-fired, 20 kW, 26.8 hp) – Project No. 68818
- ES-156GI (Diesel fuel-fired, 20 kW, 26.8 hp) – Project No. 68818
- ES-157GI (Diesel fuel-fired, 20 kW, 26.8 hp) – Project No. 68818
- ES-158GI (Diesel fuel-fired, 20 kW, 26.8 hp) – Project No. 68818
- ES-159GI (Diesel fuel-fired, 100 kW, 134.1 hp) – Project No. 60821
- ES-16FPATF (Diesel fuel-fired fire pump, 117 kW, 156.9 hp) – Project No. 77498

1. Description:
   These emergency generators and the fire pump are fired by Diesel fuel only. The maximum operation of each emergency generator shall not exceed 500 hours per the 1995 EPA guidance from John S. Seitz, Director of the Office of Air Quality Planning and Standards. Emissions from the engines are uncontrolled.

2. Applicable Regulatory Requirements: The generators listed in Section VI. C. above will be classified as significant sources because they are subject to the RICE MACT. This facility has already triggered a facility wide toxics evaluation and has performed modeling in accordance with Section 2.3 of the Air Permit revision T35. The facility wide toxics demonstration and modeling was submitted on December 29, 2011. Under current regulatory requirements, when the permit for the facility-wide toxics evaluation is processed, these units along with all the other combustion sources will be included as significant sources and in the air toxics section.

   NSPS, Subpart IIII, does apply to each of these generators, and they are also subject to MACT, Subpart ZZZZ. Subpart ZZZZ was revised, and re-published in the Federal Register on January 18, 2008 with an effective date of March 18, 2008. This revision included engines with capacities greater than 500 brake horsepower and engines with capacities less than 500 brake horsepower located at major sources of HAP emissions.

Per 40 CFR §63.6590(a)(2)(ii), a stationary RICE with a capacity equal to or less than 500 brake horsepower located at a major source of HAP emissions is considered new if it commenced construction (on-site fabrication) on or after June 12, 2006.

Per 40 CFR §63.6590(c) "Stationary RICE Subject to the Regulations Under 40 CFR Part 60", new emergency compression ignition generators less than 500 brake horsepower site rating must only meet the requirements of NSPS, Subpart IIII.

The following provides a summary of limits and/or standards for the emission sources described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Visible emissions	20 percent opacity	15A NCAC 2D .0521
Sulfur dioxide	Burn fuel that contains less than 15 parts per million sulfur content	15A NCAC 2D .0524 40 CFR Part 60 Subpart IIII
Hazardous Air Pollutants	Initial notification requirements and/or meet the requirements of NSPS IIII	15A NCAC 2D .1111 40 CFR Part 63, Subpart ZZZZ
NMHC + NOx, HC, NOx, CO, PM	Purchase engine certified to meet the applicable engine design emission limits	15A NCAC 2D .0524 40 CFR Part 60 Subpart IIII
Toxic air pollutants	Evaluation required	15A NCAC 2Q .0702(18) 15A NCAC 2D .1100

a. 15A NCAC 2D .0524, NSPS, 40 CFR Part 60, Subpart IIII, "Sulfur Dioxide Emissions"

Regulation Analysis:

i. Each generator shall burn fuel that contains less than 15 parts per million sulfur content.

ii. Emergency generators may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State, or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year.

Monitoring/Recordkeeping/Reporting [15A NCAC 2Q .0508(f)]

iii. No monitoring, recordkeeping, or reporting is required for sulfur dioxide emissions from the firing of diesel fuel in any emergency generator.

b. 15A NCAC 2D .0521"Control Of Visible Emissions"

Regulation Analysis:

i. Generators will be installed after July 1, 1971, and each is therefore subject to the State regulation 15A NCAC 2D .0521(d). Per this regulation visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute periods averaging more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period for each boiler.

Compliance is expected with this regulation because all of the generators will be firing diesel fuel.

Monitoring/Recordkeeping/Reporting [15A NCAC 2Q .0508(f)]

ii. No monitoring, recordkeeping, or reporting is required for visible emissions from the firing of diesel fuel in any generator because it should always be in compliance with the opacity standard during normal operation.

c. 15A NCAC 2D .1111, 40 CFR Part 63, Subpart ZZZZ: National Emission Standards for Hazardous Air Pollutants For Reciprocating Internal Combustion Engines

i. General Provisions [40 CFR §63.6665]:
The Permittee shall comply with the requirements of 40 CFR part 63 Subpart A "General provisions," according to the applicability of Subpart A to such sources, as identified in Table No. 8 in Subpart ZZZZ, "Applicability Of General Provisions to Subpart ZZZZ".

ii. Compliance/Notification Procedures [40 CFR §63.6645]

Per 40 CFR §63.6590(c) "Stationary RICE Subject Regulations Under 40 CFR Part 60", new emergency compression ignition generators less than 500 brake horsepower site rating must only meet the requirements of NSPS, Subpart IIII.

Per 40 CFR §63.6590(c) "Stationary RICE Subject Regulations Under 40 CFR Part 60", new compression ignition generators less than 500 brake horsepower site rating must only meet the requirements of NSPS, Subpart IIII.

Per 40 CFR §63.6590(b)(i) "Stationary RICE Subject to limited Requirements" a new emergency generator with a site rating greater than 500 brake horsepower located at a major source of HAP emissions does not have to meet the requirements of Subpart ZZZZ or Subpart A of this part except for the initial notification requirements of 63.6645(f)

The owner or operator of an affected source that has an initial startup before the effective date of a relevant standard under this part shall notify the Administrator in writing that the source is subject to the relevant standard. The notification, which shall be submitted not later than 120 calendar days after startup of the emergency generator and shall provide the following:

(A) The name and address of the owner or operator;
(B) The address (i.e., physical location) of the affected source;
(C) An identification of the relevant standard, or other requirement, that is the basis of the notification and the source's compliance date;
(D) A brief description of the nature, size, design, and method of operation of the source and an identification of the types of emission points within the affected source subject to the relevant standard and types of hazardous air pollutants emitted;
(E) A statement of whether the affected source is a major source or an area source.
(F) A statement that each generator has no additional requirements and explain the basis for the exclusion (for example, that the units operate exclusively as emergency stationary RICE).

iii. Recordkeeping Requirement For Applicability Determination [40 CFR §63.10(b)(3)]
The applicability determination for exclusion of these emergency generators from the requirements of 40 CFR Part 63, Subpart ZZZZ and Subpart A of this part, shall be maintained on site for a period of 5 years after the determination, or until the source changes its operations to become an affected source, whichever comes first. The analyses, or other information, that demonstrates the exemption from the requirements of Subpart ZZZZ and part A of this subpart, shall be signed by the person making the determination.

iv. Monitoring/Reporting [15A NCAC 2Q .0508(f)]

- Owner/operators who purchase an emergency generator that is less that 30 liters per cylinder must purchase units that are certified by the manufacturer to meet the applicable engine design emission limits. {§60.4211 (c)}.

- Owners/operators must operate and maintain engines and control devices in accordance with the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the life of the engine. {§60.4206 and §60.4211 (a)}.
- No testing is required for units less than 30 liter per cylinder displacement that have been certified by the manufacturer to meet design limits.
- Install a nonresettable hour meter {§60.4209(a)}.

d. PSD Evaluation:
The Fort Bragg facility is a major source for PSD emissions. The modifications that occur at the base shall be evaluated against the PSD significance levels based on projects. The worse case pollutant from the combustion process will be NOx with a significance level of 40 tons per year and GHGs with a significance level of 75,000 tons per year.

Green House Gases:
Currently (January 2011) the DAQ recognizes only four of the six spelled out in the Federal Register: Methane (CH_4), Carbon Dioxide (CO_2), Nitrous Oxide (N_2O), Hydrofluorocarbons (HFCs).

i. Project number PN63006 will add one emergency generator (ES-152) at a kW rating of 350 kW (469.4 hp). This represents the largest combined power rating of the emergency generator projects listed above.

Since this emergency generator will be certified by the manufacturer to meet the requirements of NSPS Subpart IIII for Diesel-fired engines, the maximum NOx (worse case pollutant) emissions will be 9.2 grams/kW-hour.

The total NOx emission rate from this project is less than 40 tons per year (at 1.77 tpy). Therefore, no PSD avoidance condition needs to be written. See example calculation below.

$$\left[\frac{9.2\text{ g}}{\text{kW}-\text{hour}}\times 350\text{ kW}\times\frac{1\text{ lbs NOx}}{453.59\text{ g}}\right]\times\frac{1\text{ ton}}{2000\text{ lbs}}\times\frac{500\text{ hrs}}{\text{year}}=\frac{1.77\text{ tons NOx}}{\text{year}}$$

The GHG emission factor (was taken from 40 CFR Part 98 "Mandatory Greenhouse Gas Reporting", Subpart C, Table C-2 for Petroleum fuel types) is 73.96 kg CO_2/mmBtu. The total GHG emission rate from this project is less than 75,000 tons per year (at 134.0 tons per year). Therefore, no PSD avoidance condition for GHGs needs to be written. See example calculation below.

In accordance with EPA's AP-42 Chapter 3.3 (Table 3.3-1; Reference a), an average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr was used to convert from lb/mmBtu to lb/hp-hr when necessary.

$$\frac{73.96\ kg\ CO_2}{1\times10^6\ Btu}\times\frac{1000\ g}{kg}\times\frac{1\ lb}{453.59\ g}\times\frac{7000\ Btu}{hp-hr}=\frac{1.14\ lbs\ CO_2}{hp-hr}$$

$$\left[\frac{1.1413\ lbs\,CO_2}{\text{hp-hr}}\times 469.4\ hp\right]\times\frac{1\text{ ton}}{2000\text{ lbs}}\ \frac{500\text{ hrs}}{\text{year}}=\frac{134.0\text{ tons}\,CO_2}{\text{year}}$$

Methane and Nitrous oxide emissions emit less than 0.02 tons per year total.

D. Welding Operations/Shops:
- IES-13W (located in Building 558)
- IES-14W (located in Building 562)
- IES-15W (located in Building A2206)
- IES-16W (located in Building A2905)
- IES-17W (located in Building A3804)
- IES-18W (located in Building A4326)
- IES-19W (located in Building A4333)
- IES-20W (located in Building A4521)
- IES-21W (located in Building M-8139)

2. Description:
Welding is the process by which two metal parts are joined by melting the parts at the points of contact and simultaneously forming a connection with molten metal from a consumable electrode. For example, one type of welding is fusion. In this process, the work pieces are melted together using a filter metal (i.e. consumable electrode). Arc, resistance, and oxy fuel gas are all fusion processes. Metal rods and wires are used as consumable electrodes or filler metals. Soldering involves the joining of two metals using heat and a filler metal to produce metallurgical bonds. Usually, an alloy like lead-tin is used as the filler metal.

2. Applicable Regulatory Requirements: These sources will be permitted in accordance with 15A NCAC 2D .0503(8) and added to the insignificant activities list. Particulate emissions were calculated in Appendix B of the application and estimated to be less than five tons per year and HAPs less than 1000 lbs per year.

   Emissions were calculated assuming the following;
   Welding rods were assumed to be 80% consumed. In practice, often only 50-60% of the rod is consumed, as it is held by hand. The normalized emission factor presented for welding rods in the table below has been adjusted by a factor of 0.80 to account for this. Welding wires were assumed to be 100% consumed. Emissions estimates were determined by multiplying the usage rate by the listed emission factor for a particular pollutant. Annual consumption rates per booth are assumed to be 1500 lbs rod/year and 1500 lbs of wire/yr.

   As demonstrated by the emission from each booth, these sources are insignificant in accordance with 15A NCAC 2Q .0503(8).

   Example calculations for Particulate using welding rods and welding wire:

$$\frac{81.60\ lbs\ PM}{1000\ lbs} \times \frac{80}{100}(\%) \times \frac{1500\ lbs\ rod}{year} = \frac{97.92\ lbs\ PM}{year}$$

$$\frac{81.60\ lbs\ PM}{1000\ lbs} \times \frac{100}{100}(\%) \times \frac{1500\ lbs\ wire}{year} = \frac{122.40\ lbs\ PM}{year}$$

   Total pounds of PM from the 9 welding booths:
   (97.92 + 122.40) x 9 booths = 1982.88 lbs of PM per year (0.99 tons/yr)

   Example Manganese compounds using both welding rods and welding wire:

$$\frac{232 \times 10^{-1}\ lbsMn}{1000\ lbs} \times \frac{80}{100}(\%) \times \frac{1500\ lbs\ rod}{year} = \frac{27.84\ lbs\ PM}{year}$$

$$\frac{232 \times 10^{-1}\ lbsMn}{1000\ lbs} \times \frac{100}{100}(\%) \times \frac{1500\ lbs\ rod}{year} = \frac{34.8\ lbs\ PM}{year}$$

   Total pounds of Manganese compounds from the 9 welding booths:
   (27.84 + 34.8) x 9 booths = 564 lbs of manganese per year (0.28 tons/yr)

   As demonstrated by Table 2 below, the emissions from nine booths are insignificant in accordance with 15A NCAC 2Q .0503 (8).

Table 2

CAS#	Compound					Emission Factor [1] (lbs/1000 lb)	Emission Factor [1] (lbs $^{-1}$/1000 lb)	Normalized Emission Factor -Rod (lb/lb)	Normalized Emission Factor -Wire (lb/lb)	Total Emissions per Booth (ton/yr)	Total Emissions (9-booths) (tons/yr)
Criteria Pollution											
Particulate Matter				Yes		81.60		0.06528	0.0816	0.11	0.991
Particulate Matter < 10µm				Yes		81.60		0.06528	0.0816	0.11	0.991
Metals	TAP	HAP	PAH	POM						lbs/yr	lbs/year
Chromium	No	Yes	No	Yes			25.30	0.002024	0.00253	6.83	61.5
Chromium VI	Yes	Yes	No	Yes			18.80	0.001504	0.00188	5.08	45.7
Cobalt metal	No	Yes	No	Yes			0.01	0.0000008	0.000001	0.003	0.024
Lead	No	Yes	No	Yes			1.62	0.0001296	0.001620	0.437	3.94

Manganese compounds	Yes	Yes	No	Yes			232.0	0.01856	0.0232	62.6	564.0
Nickel metal	Yes	Yes	No	Yes			17.10	0.001368	0.00171	4.62	41.6

[1] Emission factors are taken from the US EPA AP-42, chapter 12.19, Tables 12.19-1 and 12.19-2. The rod and wire surrogate was created by taking the highest emission factor for each AP-42 identified pollutant from all rod and wire types.

E. Remediation Site with Air Stripper:
- IES-01RDL (located in Building 771)

1. Description:
Groundwater remediation systems are used to remove contaminants from soil and groundwater. These systems can be a point source of emissions if there is an air stripper unit. The air stripper unit is designed to treat contaminated groundwater by forcing air through the soil and water to volatilize contaminants. Emissions are calculated using emissions factors and the maximum annual contaminated ground water throughput to the device. Typical results of the treated water at the influent and effluent of an air stripper device are utilized to develop the emission factors on a (lb/gallon) basis. Total VOCs is assumed to be the sum of all volatile components.

2. Applicable Regulatory Requirements: This source will be permitted in accordance with 15A NCAC 2D .0503(8) and added to the insignificant activities list. Particulate emissions were calculated in Appendix B of the application and estimated to be less than five tons per year and HAPs less than 1000 lbs per year.

Operation of remediation system:
365 days per year
3,500 gallons per day
120,000 gallons per year

Table 3

CAS#	Compound					Influent Concentration (µg/L)	Effluent Concentration (µg/L)	Admitted to Atmosphere (influent – effluent) lbs/gal	Total Emissions (tons/yr)
Criteria Pollution									
VOCs						409	5.68	3.36E-06	0.00
Organic Compounds	TAP	HAP	VOC	PM					lbs/yr
Benzene	Yes	Yes	Yes	No		1.47	0.40	8.93E-09	0.001
Ethyl benzene	No	Yes	Yes	No		33.30	0.43	2.74E-07	0.033
Ethylene Dichloride	Yes	Yes	Yes	No		0.68	0.34	2.84E-09	0.000
Methyl Isobutyl Ketone	Yes	Yes	Yes	No		1.10	0.26	7.01E-09	0.001
Napthalene	No	Yes	Yes	No		38.00	2.70	2.95E-07	0.035
Toluene	Yes	Yes	Yes	No		105.00	0.35	8.73E-07	0.10
Xylene (Mixed Isomers)	Yes	Yes	Yes	No		229.00	1.20	1.90E-06	0.23

[1] Emissions to the air are based on water sampling results and are assumed to be the difference between what was in the contaminated water in the influent and the concentration of contaminant after treatment at the effluent of the device.

[2] Emissions are converted from µg/L using the constant 3.785 L/gal and 2.205E-09 lbs/µg.

Example calculation for VOCs:

$$\frac{[409-5.68]\,\mu g}{liter}\times\frac{3.785\,liters}{gallon}\times\frac{2.205\times10^{-9}\,lbs}{\mu g}=\frac{3.66\times10^{-6}\,lbs\,VOCs}{gal}$$

Example calculation for Ethyl Benzene:

$$\frac{[33.30 - 0.43]\ \mu g}{liter} \times \frac{3.785\ liters}{gallon} \times \frac{2.205 \times 10^{-9}\ lbs}{\mu g} \times \frac{120{,}000\ gallons}{year} = \frac{0.033\ lbs\ Ethyl\ Benzene}{year}$$

As demonstrated in Table 3 above, the emissions from this source is insignificant in accordance with 15 NCAC 2D .0503(8).

F. Storage Tanks:
- IES-03T558A (Horizontal aboveground storage tank, 2000 gallon capacity, E-85 fuel)
- IES-03T558B (Horizontal aboveground storage tank, 1000 gallon capacity, E-85 fuel)
- IES-03T625 (Horizontal above ground storage tank, 1000 gallon capacity, gasoline)

1. Description: These tanks store fuels that are used in equipment at the Fort Bragg facility.
2. Applicable Regulatory Requirements: These sources will be permitted in accordance with 15A NCAC 2D .0503(8) and added to the insignificant activities list. Particulate emissions were calculated in Appendix B of the application and estimated to be less than five tons per year and HAPs less than 1000 lbs per year.

   Storage tank emissions are calculated using emission factor developed from TANKs 4.09 for each tank. The factors are then applied using the fuel speciation. The equations listed below demonstrate how emissions were calculated for each tank.

   Emission Calculations for Storage Tank Surrogates
   Speciated emission factors: Weight Fraction x EF
   Annual Emissions (lb/yr) = Vapor Weight Fraction x (Standing Losses (lbs/yr) + Working Losses (lbs/yr)
   Standing Losses (lbs/yr) = S_LOSS Emission Factor {(lbs/hr-gal)} x Actual Storage Volume of Tank (gal) x 8760 (hrs/yr)
   Working Losses (lbs/yr) = W_LOSS Emission Factor (lb/gal) x Potential Tank Throughput (gal) (assumed to be 10 turnovers per year)

Tank Number	Tanks Results		Emission Factors	
	S_LOSS (lbs/yr)	W_LOSS (lbs/yr)	S_LOSS EF [lbs/hr-gal)]	W_LOSS EF (lbs/gal)
IES-03T558A	611.37	128.55	3.49E-05	6.43E-03
IES-03T558B	288.21	64.27	3.29E-05	6.43E-03
IES-03T625	496.44	64.27	5.67E-05	6.43E-03

1) The weather data for Raleigh was used as it is the geographically closest city in TANKS4.09.
2) For TANKS4.09 runs, all tanks were assumed to be in good working condition and were entered with a color or shade of gray/light.

The following table has the vapor weight fraction of gasoline. These vapor weight fractions are applied to the derived emissions factors from the TANKS4.09 results to develop an emission factor for each compound.

The product of the standing loss emission factor, the total capacity of the tank, 8760 hours/yr operation, and the vapor weight fraction, are used to calculate the standing loss emissions for each tank.

The product of the working loss emission factor, the potential tank throughput, and the vapor weight fraction are used to calculate the working loss emission for each tank.

Table 4 (Storage Tanks)

Compound	Gasoline Vapor Weight Fraction	Emissions from IES-03T558A	Emissions from IES-03T558B	Emissions from IES-03T625	Total Emissions from Tank
Criteria Pollutants					
Volatile Organic Compounds	1.00	0.370	0.176	0.280	0.827
Organic Compounds		(lbs/yr)	(lbs/yr)	(lbs/yr)	(lbs/yr)
2,3,4-Trimethylpentane	9.5E-03	7.05	3.36	5.34	15.8
Benzene	6.3E-03	4.62	2.20	3.50	10.3

Cresol (mixed isomers)	6.5E-06	0.005	0.002	0.004	0.011
Cumene	1.7E-04	0.123	0.059	0.093	0.274
Ethylbenzene	6.3E-04	0.467	0.222	0.354	1.04
Methyl Tert Butyl Ether	3.6E-02	26.8	12.8	20.3	59.8
Naphthelene	5.5E-06	0.004	0.002	0.003	0.009
N-Hexane	4.4E-02	32.4	15.6	24.8	73.2
Phenol	1.1E-06	0.001	0.000	0.001	0.002
Styrene	8.8E-04	0.653	0.311	0.495	1.46
Toluene	8.4E-03	6.23	2.97	4.72	13.9
Xylene (mixed isomers)	2.4E-03	1.74	0.828	1.32	3.88

As demonstrated in Table 4 above, the emissions from the storage tanks are insignificant in accordance with 15 NCAC 2D .0503(8).

G. X-Ray Operation (located in Building 731):

1. Description:
   Fort Bragg is proposing to add an X-Ray Fuji Hunt developer/replenisher/fixer kit at the Base. Emissions from this source are generated by evaporation of the volatile constituents of the material utilized during the process of x-rays. Emission factors are based on the specific gravity of the materials and weight percentage of its constituents as documented on the MSDS. The MSDS sheets for this kit are divided into parts A, B, and C. Each part has different constituents at varying weight percentages.

2. Applicable Regulatory Requirements: This source will be permitted in accordance with 15A NCAC 2D .0503(8) and added as insignificant activities. Particulate emissions were calculated in Appendix B of the application and estimated to be less than five tons per year and HAPs less than 1000 lbs per year.

   Maximum and annual potential emissions are calculated based on a maximum usage estimate of: 120 gallons/year. This throughput assumes the 10 gallon unit is turned over 1 time per month, and the approximately 30% of the material used evaporates during the course of the month.

Table 5 (X-ray Operation)

	Compound				Weight Percentage [1]	Specific Gravity [1]	Emissions (tpy)
Criteria Pollutants							
Part A	Volatile Organic Compounds				55	1.24	0.102
Part B	Volatile Organic Compounds				25	1.12	0.042
Part C	Volatile Organic Compounds				60	1.21	0.109
Organic Compounds		TAP	HAP	VOC		(lbs/yr)	(lbs/yr)
Part A	Hydroquinone		Y	Y	7	1.24	26.1
Part B	Acetic acid	Y		Y	20	1.12	67.3

As demonstrated in Table 4 above, the emissions from the storage tanks are insignificant in accordance with 15 NCAC 2D .0503(8).

H. Tank Cleaning and Purging System:

1. Description:
   This system contains an over the road fuel tank cleaning machine (referred to as a tank purger). The machine will clean residual JP-8 from the tankers. The majority of the tankers cleaned will be HEMMITT-pulled tankers and the remainder will be semi-pulled trailers. The tankers will first have the fuel removed from them using a vacuum. After this process an estimated 20 gallons of fuel will be left in the tankers (which could not be vacuumed out). After this step, the machine uses a closed loop wash system designed to allow continuous reuse of wash and rinse solutions. Residual JP-8 is returned to the wash tank, allowed to separate and recovered. Some of the residual JP-8 will volatize and be emitted during the wash process (estimates at 25%). There is also a 4.2 mmBtu/hr direct propane fired contact water heater associate with this process.

2. Applicable Regulatory Requirements:

Criteria pollutants from the source are below 5 tons per year, except for Volatile Organic Compounds at (30.8 tons per year). HAP emissions of Benzene, N-hexane, Toluene, and Xylene are greater than 1000 lbs per year each. Therefore, this source is to be permitted as a significant source in the Title V Air Permit.

Emissions from the purging system:

Maximum tankers processed per day	5 tankers/day
Days per year	365 days/yr
Gallons of residue fuel after vacuum	20 gallons/tanker
Residual which volatizes (not collected)	25%
JP-8 fuel density	6.7 lbs/gallon
Estimated quantity of evaporated JP-8 fuel	61,138 lbs/yr

Calculation of evaporated JP-8 fuel per year:

$$\frac{20\ gallons}{\text{tanker}} \times \frac{5\ \text{tankers}}{day} \times \frac{365\ days}{year} \times \frac{6.7\ lbs VOCs}{gallon} \times \frac{25}{100}(\%\ volatization) = \frac{61{,}138\ lbs VOCs}{year}$$

Sample Calculation for VOC emissions:

$$\frac{20\ gallons}{\text{tanker}} \times \frac{5\ \text{tankers}}{day} \times \frac{365\ days}{year} \times \frac{6.7\ lbs\ VOCs}{gallon} \times \frac{25}{100}(\%\ volatization) \times \frac{1\ ton}{2000\ lbs} = \frac{30.6\ tons\ VOCs}{year}$$

Table 6

CAS#	Compound	JP-8 Vapor Weight Fraction [1]	Emissions (tons/yr)
Criteria Pollutants			
VOC	Volatile organic compounds	1.0	30.6
Organic Compounds			(lbs/year)
540-84-1	2,2,4-Trimethypentane	0.00327	200
71-43-2	Benzene	0.0215	1,314
92-52-4	Biphenyl	0.0000087	0.53
1319-77-3	Cresol (mixed isomers)	0.0000381	2.33
98-82-8	Cumene	0.00193	118
100-41-4	Ethybenzene	0.00892	545
91-20-3	Naphthelene	0.000796	48.7
110-54-3	N-hexane	0.2282	13,952
108-95-2	Phenol	0.000136	8.31
108-88-3	Toluene	0.06	3,668
1330-20-7	Xylene (mixed isomers)	0.0291	1,779

[1] Vapor weight speciation data for the fuels is taken from the vapor weight speciation data prepared for the fuels by Radian for the EPA in regards to the American Petroleum Institute.

Emissions from the propane-fired water heater:

- Heat input to heater = 4.2 mmBtu/hr
- Operating hours = 8760 hrs/yr
- Heat value of LP gas = 91.5 x 10^6 Btu/gallon

Table 7 (Emissions from water heater)

		LP gas in water heater			
		Emission Factors [1]		Emissions from heater	Total emissions
	Compound	(lbs/10^3 gal	(lb/mmBtu)	(tons/yr)	(tons/yr)
Criteria Pollutants					
CO	Carbon monoxide	7.5	0.082	1.51	1.51

NOx	Nitrogen oxide	13.0	0.142	2.61	2.61
PM	Particulate Matter	0.7	0.008	0.14	0.14
PM_{10}	Particulate Matter < 10µ	0.7	0.008	0.14	0.14
$PM_{2.5}$	Particulate Matter < 2.5µ	0.7	0.008	0.14	0.14
SO_2	Sulfur dioxide	0.02	0.000	0.00	0.00
VOC	Volatile organic compounds	1.0	0.011	0.20	0.20

[1] LP emission factors taken form EP's AP-42 Chapter 11.5. Sulfur content assumed to be 0.18 gr/cu. ft.

Table 8 (Emissions from the Tank Purging process)

CAS#	Compounds	Emissions from Evaporation	Emissions from heater	Total Emissions
	Criteria Pollutants	(tons/yr)	(tons/yr)	(tons/yr)
CO	Carbon monoxide	----------	1.51	1.51
NOx	Nitrogen oxide	----------	2.61	2.61
PM	Particulate Matter	----------	0.14	0.14
PM_{10}	Particulate Matter < 10µ	----------	0.14	0.14
$PM_{2.5}$	Particulate Matter < 2.5µ	----------	0.14	0.14
SO_2	Sulfur dioxide	----------	0.00	0.00
VOC	Volatile organic compounds	30.6	0.20	30.80

Table 9

CAS#	Compound				Emissions from evaporation	Emissions from Heater	Total Emissions
Criteria Pollutants		TAP	HAP	POM	(lbs/yr)	(lbs/yr)	(lbs/yr)
540-84-1	2,2,4-Trimethypentane		Y		200	----------	200
71-43-2	Benzene	Y	Y		1,314	----------	1,314
92-52-4	Biphenyl		Y		0.53	----------	0.53
1319-77-3	Cresol (mixed isomers)	Y	Y		2.33	----------	2.33
98-82-8	Cumene		Y		118	----------	118
100-41-4	Ethybenzene		Y		545	----------	545
91-20-3	Naphthelene		Y	Y	48.7	----------	48.7
110-54-3	N-hexane	Y	Y		13,952	----------	13,952
108-95-2	Phenol	Y	Y		8.31	----------	8.31
108-88-3	Toluene	Y	Y		3,668	----------	3,668
1330-20-7	Xylene (mixed isomers)	Y	Y		1,779	----------	1,779

VII. The application was signed by an authorized official as defined by 15A NCAC 2Q .0304(j).

VIII. An air toxics review and evaluation is triggered with addition of the combustion sources, welding shops, storage tanks, and x-ray operation in this revision.

Air toxic modeling is required for this facility because of the recent regulatory (15A NCAC 2Q .0701, .0702, .0706 and .0709) change (effective July 10, 2010) to remove the exemption to exclude combustion sources as emitters of toxic air pollutants.

A facility wide toxics evaluation has been performed by Fort Bragg and was submitted to the RCO on December 29, 2011 for the sources at the Title V air permit through revision T35. The sources in this modification were not included in that submittal but the addition of these sources were evaluated and considered not to cause a significant impact or violate any ambient air quality standards.

IX. Public Notice:

A thirty-day public notice is not required at this time. However, the facility will be required to resubmit an application for the sources involved in this modification within 12 months of operation to go through the 30-day public notice and the 45-day EPA review process.

X. NonAttainment:
Fort Bragg Army Post is located in Cumberland County. The current Section 107 attainment status designations for areas within the state of North Carolina are summarized in 40 CFR 81.334. Cumberland County is classified as "better than national standards" for total suspended particulates (TSP, also referred to as Particulate Matter, PM, which includes particulate matter less than 10 microns, PM10) and for sulfur dioxide (SO2). Cumberland County is designated as "unclassifiable/attainment" for carbon monoxide (CO), PM2.5 and 1-hour standard for ozone. Cumberland County is designated as "cannot be classified or better than national standards" for nitrogen dioxide (NO_2). Cumberland County is designated as "attainment" for the 8-hour standard for ozone.

XI. This facility is subject to 15A NCAC 2Q .0508(g) "Prevention of Accidental Releases". Fort Bragg submitted its Risk Management Plan (RMP) in June 2004.

XII. For PSD Increment tracking purposes, the PSD Minor Source Baseline date was triggered in Cumberland County for particulate matter and SO_2 on July 26, 1978 and for NOx on August 20, 2001. The addition of the sources in the specific modifications in accordance with the individual project numbers will increase particulate matter, sulfur dioxide, and nitrogen oxide emissions.

All of the generators being added in the different projects would individually emit over 1.0 lbs per hour of NOx. Therefore, all of these projects have been added together (kW) and considered one project for increment tracking purposes. The NSPS allowable exhaust emission standards were used for the calculations.

Example Calculation for generators:

Nitrogen Oxide/Sulfur dioxide/PM10:
The total combined kW rating for all of the added generators is: 1230 + 1230 + 1230 + 1000 + 600 + 500 + 125 + 125+ 100 + 200 + 100 + 350 + 100 + 100 + 20 + 20 + 20 + 20 + 100 + 117 = 7287 kW

$$\left[\frac{9.2\text{ g NOx}}{\text{kW}-\text{hour}} \times 7287\text{ kW} \times \frac{1\text{ lbs NOx}}{453.59\text{ g}}\right] = \frac{147.80\ lbs\ \text{NOx}}{\text{hour}}$$

$$\left[\frac{0.54\text{ g PM10}}{\text{kW}-\text{hour}} \times 7287\text{ kW} \times \frac{1\text{ lbs }PM10}{453.59\text{ g}}\right] = \frac{8.7\ lbs\ PM10}{\text{hour}}$$

$$\left[\frac{2.03\text{E}^{-}03\text{ g }SO_2}{\text{kW}-\text{hour}} \times 7287\text{ kW} \times \frac{1\text{ lbs}PM10}{453.59\text{ g}}\right] = \frac{0.03\ lbs\ SO_2}{\text{hour}}$$

Maximum hourly emissions for PSD increment tracking purposes:

Pollutant	Generators (total kW = 7287)	Natural gas-fired Boilers (total heat input = 26.13)	Tank purging system	Welding operations	Total Emissions
NOx	147.8 lbs/hr	2.53 lbs/hr	0.6 lbs/hr	----------	151 lbs/hour
PM10	8.7 lbs/hr	0.18 lbs/hr	0.03 lbs/hr	0.23 lbs/hr	9.14 lbs/hour
SO_2	0.03 lbs/hr	0.03 lbs/hr	----------	----------	0.06

Total PM10 emissions from all modifications in this application = 9.14 lbs/hr
Total NOx emissions from all modifications in this application = 151.0 lbs/hr)
Total SO_2 emissions from all modifications is less than 1.0 lb per hour and will not be listed in the permit cover letter.

For PSD increment tracking purposes, the NOx emission rate is increased by 151 pounds per hour, and the PM_{10} emissions rate is increased by 9.14 pounds per hour.

XIII. The permit review and draft permit were sent to the Fayetteville Regional office on March 20, 2012 and sent to the applicant on March 14, 2012. Fort Bragg responded on March 20, 2012 to the draft permit and sent administrative comments. These comments were incorporated into the Air Permit and are included at the back of this permit as Attachment A.

XIV. Recommendations

This modification issued under section 15A NCAC 2Q .0501(c)(2) for XVII Airborne Corps and Fort Bragg, located in Fort Bragg, Cumberland County, North Carolina, has been reviewed by the DAQ to determine compliance with all procedures and requirements. The Fayetteville Regional Office did make comments on the draft permit. The DAQ has determined that this facility is complying or will achieve compliance as specified in the permit with all applicable requirements. The Fayetteville Regional Office concurs.

Issue permit No. 04379T36

ATTACHMENT A – Applicant Comments to draft permit.

(1) Woodworking Operation at Bldg 2-2405 and IES-03WO Woodworking Operation, SOTF

IES-04WO, Woodworking Operation, Bldg 2-2405, which currently operates, was inadvertently removed from the permit through the T35 modification permitting action (issued 27 October 2011).

Concurrently, Fort Bragg has learned that IES-03WO, Woodworking Operation, SOTF, has been modified such that PM emissions are filtered with the exhaust venting back inside the woodworking shop and therefore is no longer an emissions source.

Fort Bragg requests that IES-03WO be withdrawn and IES-04WO reinstated. Fort Bragg proposes to rename IES-03WO from "Woodworking Operation, SOTF" to "Woodworking Operation, 2-2405" in lieu of creating a new ID. Alternatively, Fort Bragg requests that IES-03WO be withdrawn/removed from the permit and IES-04WO, 2-2405 reinstated.

(2) Please add building numbers to the weld shops Permit ID Descriptions on page 3 of 4 as follows:

IES-13W	Welding Shop, 558
IES-14W	Welding Shop, 562
IES-15W	Welding Shop, A2206
IES-16W	Welding Shop, A2905
IES-17W	Welding Shop, A3804
IES-18W	Welding Shop, A4326
IES-19W	Welding Shop, A4333
IES-20W	Welding Shop, A4521
IES-21W	Welding Shop, M8139

(3) Page 3 of 4: Emissions Source IES-04AB is duplicated in the insignificant source list on page 1 of 4 and on page 3 of 4. Please remove IES-04AB from page 3 of 4 and keep IES-04AB on page 1 of 4.

(4) All previously insignificant generators have been renamed and removed from the insignificant source list. The NSPS/MACT footnotes (" * " and " ^ ") at the bottom of the insignificant source lists on pages 3 of 4 and 4 of 4 are no longer required.

(5) Page 11: Fort Bragg requests the description for ES-107BD be changed from "Diesel-fired emergency generator (62 kW maximum output)" to "Off-road Engine (83 HP, Brass Deformer)". Please also change the Permit ID description for ES-107BDI on 83 (list of NSPS diesel-fired generators). The Permit ID on pg 11 should include an "I" at the end because this unit was previously an insignificant emissions source.

(6) Page 12: ES-118GI is not subject to NSPS. Please remove the NSPS from the Emissions Source ID. ES-119GI is subject to NSPS. Please add the NSPS reference to the Emissions Source ID. (Note: The NSPS applicability for these generators is correctly shown on page 83.)

(7) Page 12: ES-123GI is not subject to NSPS. Please remove the NSPS reference.

(8) Page 13: Change ES-147GI Description from 127 kW to 125 kW.

(9) Page 13: Fort Bragg has learned that proposed generator, ES-149GI, 100 kW Diesel Generator at SOTF Antennae Field has changed to a 150 kW generator. Please change the maximum output rating from 100 kW to 150 kW.

(10) Page 15: Fort Bragg requests that paint booths ES-04C and ES-05C be removed from the permit. Both paint booths have not been operated for several years and have been converted to storage rooms. Please remove them from Page 51, O.

(11) Page 18: 2.1.A.4.c: Change "… if the sulfur content of the fuel is not monitored." to "if the fuel usage is not monitored."

(12) Page 19: equation: The CMA boilers, ES-01CMA, ES-02CMA and ES-03CMA, were constructed with low NOx burners. Fort Bragg requests that the compliance equation on page 19 show the AP-42 low NOx burner emission factor of 50 lbs NOx/10^6 scf instead of the existing emission factor of 100 lbs of NOx/10^6 scf. The lbs NOx/10^6 scf emission factor is shown twice within the equation.

(13) Page 79: equation: The 82nd Heat Plant boilers, ES-44B, ES-45B, ES-46B, were constructed with low NOx burners. Fort Bragg requests that the compliance equation on page 79 show the AP-42 low NOx burner emission factor of 50 lbs NOx/10^6 scf instead of the existing emission factor of 100 lbs of NOx/10^6 scf. The lbs NOx/10^6 scf emission factor is shown twice within the equation.

(14) Page 23: Reporting: e.i.(A)(3) appears to be incomplete.
Page 35: Reporting: e.i. (A)(5) appears to be incomplete. Also, the numbering is not consecutive.

(15) Page 39: K table: Please change the nitrogen dioxide "Limits/Standards" reference from Section 2.2 B to 2.2 J.

(16) Page 44: The listing of generators in M appears to be incomplete. The list appears to incorporate all significant generators, with the exception of a few insignificant generators. Please revise the list as applicable. Fort Bragg requests an opportunity to review the revised list.

(17) Page 47: Please change the reference for the "Limits/Standards" for nitrogen dioxide from 2.2. B to 2.2A.

(18) Page 51. O: Please remove reference to ES-11C, which is withdrawn from the permit through this modification. Please remove the reference to ES-11C on page 52., 2.1.O.2.a.

(19) Page 53. P: Change "Limits/Standards" for HAPs from 2.2. H to 2.2 G.

(20) Page 58, T.1.c and T.2.c: change the word "natural gas" to "propane".

(21) Page 60, C: Please remove ES-04C, ES-05C and ES-11C from the list of paint booths.

(22) Page 70, H. Please add compliance requirements/dates in the "Subpart ZZZZ Requirements" column.

(23) Page 70, H.1: The list of emergency generators that were manufactured before June 2006 (existing) and are less than 500 horsepower (373 kW) is incorrect.

Please REMOVE the following:

PERMIT ID	HP RATING	CLASS 1	CLASS 2	MODE
ES-04PSG	**671**	**Existing**	**< 12 June 2006**	**Emg.**
ES-07PSG	**536**	**Existing**	**< 12 June 2006**	**Emg.**
ES-08PSG	**536**	**Existing**	**< 12 June 2006**	**Emg.**

Please ADD the following:

PERMIT ID	HP RATING	CLASS 1	CLASS 2	MODE
ES-91GI	**107**	**Existing**	**< 12 June 2006**	**Emg.**

(24) Page 70, H.1: Please change the horsepower ratings as follows:

PERMIT ID	HP RATING
ES-01PSG	**308**
ES-02PSG	**335**
ES-03PSG	**469**
ES-05PSG	**469**

ES-06PSG	**469**

(Note: The HP ratings for these generators in table H.2 are correct.)

(25) Page 75, H.4: The list of generators that were manufactured after June 2006 (new) and are less than 500 horsepower (373 kW) is incorrect.

Please REMOVE the following:

PERMIT ID	HP RATING	CLASS 1	CLASS 2	MODE
ES-91GI	**670**	**Existing**	**< 12 June 2006**	**Emg.**

(26) Page 76, ES-16FPATF: Please change the "Mode" from "Emg." to "Fire Pump".

(27) Page 76, H.5: The list of generators that were manufactured before December 2002 (existing) and are greater than 500 horsepower (373 kW) is incorrect.

Please ADD the following:

PERMIT ID	HP RATING	CLASS 1	CLASS 2	MODE
ES-07PSG	**536**	**Existing**	**< 19 Dec 2002**	**Emg.**
ES-04PSG	**670**	**Existing**	**< 19 Dec 2002**	**Emg.**
ES-08PSG	**536**	**Existing**	**< 19 Dec 2002**	**Emg.**

(28) Page 77. The table is shown as H.4. The numbering convention is incorrect.

(29) Page 77, H.4: Remove ES-7GI from the list of Emergency RICE > 500 bhp. This existing generator was manufactured in CY2001, before 19 Dec 2002.

(30) Page 82, N, NSPS List: Please add ES-74GI, a 25kW generator manufactured in August 2009. (Note: This gen is correctly identified on Pg 9 as NSPS applicable.)

(31) Page 82, N, NSPS List: Please remove ES-91GI from the list. This generator was manufactured on 3-Oct-2005. (Note: The Emissions Source ID No. on page 11 correctly omits NSPS as applicable.)

(32) Page 83, N, NSPS List: Please remove ES-113GI from the list. This generator was manufactured on 01-Oct-1997. (Note: The Emissions Source ID No. on page 12 correctly omits NSPS as applicable.)

(33) Page 83, N, NSPS List: Please remove ES-150GI from the list. This existing generator was manufactured on 18-Feb-2006, before the 01-Apr-2006 NSPS applicability date. Also, please remove the reference to NSPS applicability in the Emissions Source ID No. on Page 13.

(34) Page 85. P. Please add a "-" in the Permit ID for ES-639B.